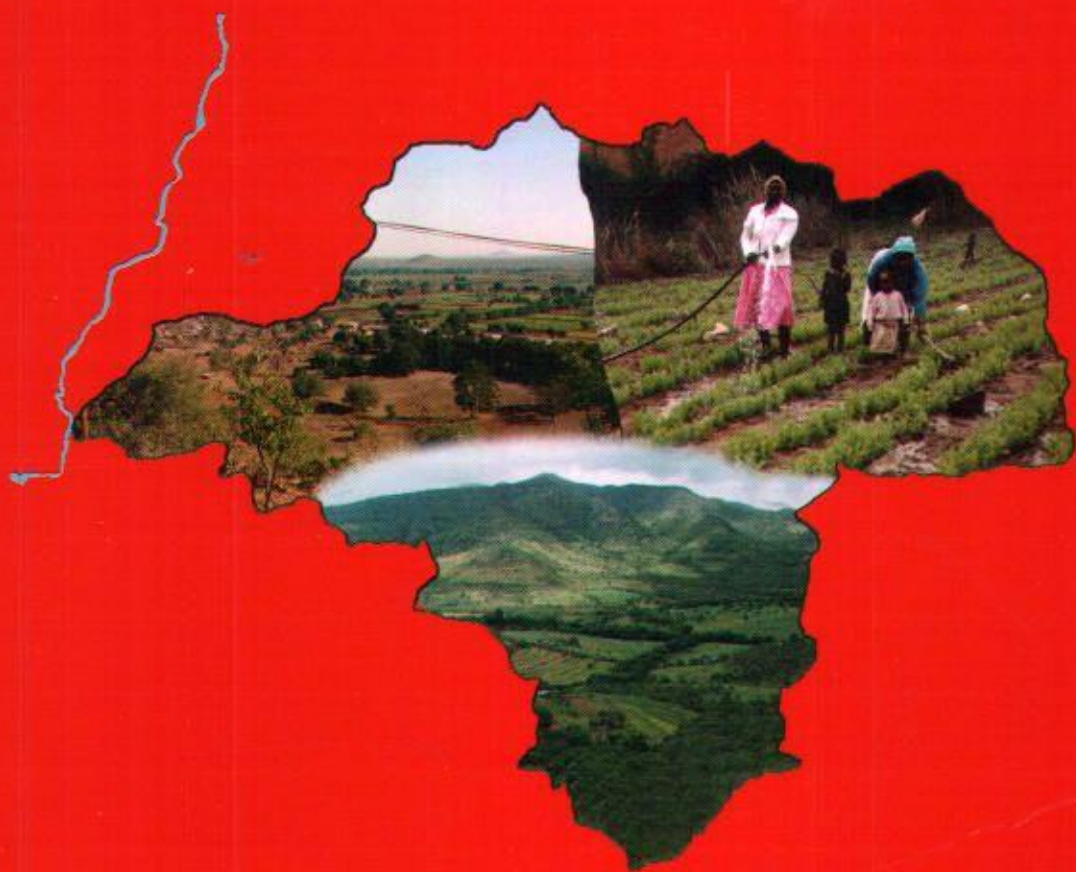


IN HOT WATER

*A study on sociotechnical intervention models and
practices of water use in smallholder agriculture,
Nyanyadzi catchment, Zimbabwe*



Alex Bolding

PROPOSITIONS

1. When one is 'seeing like a state' (Scott 1998), one runs the risk of being blinded by the state (this thesis).
2. The actual construction and performance of a research project resembles the process of building a successful water-network (this thesis).
3. Figures can't lie, but lies can figure.
4. The Zimbabwe National Water Authority (ZINWA) has been formed to improve the water situation of Zimbabwean smallholders. The latter will instantly understand this since its acronym is composed of the Shona adjective for 'big' (zi) and the Shona verb 'to drink' (ku-nwa).
5. The fact that the Bible does not disclose what Noah did with the sea-life during the flood, leaves sufficient moral room to believe in Darwin's evolutionary principles on the origins of humanity and at the same time claim to be a faithful Christian.
6. Since the privatisation of the Dutch National Railways the number and timeliness of trains has dropped, whilst the fares have increased. Paradoxically this can be understood as a sound service-orientation, since the short term effect of decreasing numbers of customers allows attainment of the medium term goal of better service provision.
7. The title of the newsletter of the Environmental Sciences Group of Wageningen University: 'Berichten uit de ruimte' (messages from outer space) appears to be an ironically accurate reflection of the distance between the management and the work floor.
8. Live while you are alive (Ben Okri, 2002, *In Arcadia*).

Propositions attached to the thesis:

In hot water. A study on sociotechnical intervention models and practices of water use in smallholder agriculture, Nyanyadzi catchment, Zimbabwe.

Alex Bolding

Wageningen University, 15 December 2004.

IN HOT WATER

*A study on sociotechnical intervention models and
practices of water use in smallholder agriculture,
Nyanyadzi catchment, Zimbabwe*

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*A study on sociotechnical intervention models and
practices of water use in smallholder agriculture,
Nyanyadzi catchment, Zimbabwe*

Alex Bolding

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DEDICATION

There is a light that never goes out
(The Smiths, 1986)

Why must you always come like a thief, Death,
Death, always silently, at night's end,
Leaving only tears?
(Death-Wedding, Tagore, 1902)

For those who died too soon,
but whose aspirations and lessons of life,
I will carry on:

Sydney Chivhenge
Frank Elias
Cornelius Kondo
Kees van Straaten

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LIST OF ABBREVIATIONS

aCNC	Assistant Chief Native Commissioner
aNC	Assistant Native Commissioner
AEW	Agricultural extension worker
AFC	Agricultural Finance Corporation
AGRITEX	Department of Agricultural, Technical and Extension Services
ARDA	Agricultural Rural Development Authority
BSAC	British South Africa Company
CAEO	Chief Agricultural Extension Officer, top Agricola at province (1992-)
CE	Chief Engineer
CNC	Chief Native Commissioner, top administrator for Africans (1895-1961)
CONEX	Department of Conservation and Extension
DA	District Administrator, top administrator at district level (1981-)
DAEO	District Agricultural Extension Officer, top agricola at district level
DC	District Commissioner, top administrator at district level (1961-1980)
DERUDE	Department of Rural Development
DEVAG	Department of Agricultural Development
DNA	Department of Native Agriculture
DR&SS	Department of Research and Specialist Services
DWD	Department of Water Development
ESAP	Economic Structural Adjustment Programme
GMB	Grain Marketing Board
ID	Irrigation Department
IM	Irrigation Manager
IMC	Irrigation Management Committee
LAA	Land Apportionment Act
LDO	Land Development Officer

MCB	Maize Control Board
MFT	Master Farmer Training
MP	Member of Parliament
NACOD	Nyanyadzi Advisory Committee on Development, urban lobby group
NAZ	National Archives of Zimbabwe
NC	Native Commissioner, top administrator at district level (1895-1961)
NDP	National Democratic Party, first African nationalist party led by Mawema (1960-1961)
NFA	Native Farmers Association
NLHA	Native Land Husbandry Act
NPA	Native Purchase Area, name for small scale commercial land
NR	Natural Region
NRB	Natural Resources Board (1941-)
NSD	Night Storage Dam
O&M	Operation and Maintenance
PAEO	Provincial Agricultural Extension Officer, top Agricola at province (1982-1992)
PC	Provincial Commissioner, top administrator at provincial level (1961-1980)
PNC	Provincial Native Commissioner, top administrator at provincial level (1895-1961)
PWE	Provincial Water Engineer, top DWD engineer at provincial level
RDC	Rural District Council
RF	Rhodesian Front, political party of Ian Smith
SRANC	Southern Rhodesia African National Congress, first African nationalist party (1957)
TTL	Tribal Trust Land, name for communal areas (1967-1982)
UDI	Unilateral Declaration of Independence (from Britain, 11 November 1965)
UANC	United African National Congress, party led by Bishop Muzorewa (1972-80)
TILCOR	Tribal Trust Land Corporation, predecessor of ARDA (1967-1981)
VIDCO	Village Development Committee
WADCO	Ward Development Committee
ZANLA	Zimbabwe African National Liberation Army
ZANU(PF)	Zimbabwe African National Union (Patriotic Front)
ZAPU	Zimbabwe African People's Union (Party of Joshua Nkomo)
ZFU	Zimbabwe Farmers Union
ZINWA	Zimbabwe National Water Authority

LIST OF SHONA/NDAU TERMS AND THEIR MEANING

Chimurenga	War of independence
Impi	Soldier
Induna	Councillor
Gurekure	Long, small, unregistered irrigation plots
Ishe	Chief
Mackes	Registered irrigation plots (Shona plural for 'acre')
Mambo	Chief
Mapfunde	Sorghum
Mhunga	Bulrush millet
Mudziviti	District Administrator
Mujiba	Young messenger for the guerrillas

Mupurisa	Chief's policeman
Musha	Homestead, popularly used to refer to 'home' (plural: misha)
Nganga	Spirit-medium
Pungwe	Nightly rally organised by guerrillas
Rapoko	Finger millet
Rovora	Bride wealth
Rukweza	Finger millet
Sabhuku	Kraalhead
Sekuru	Uncle, popularly used to refer to a senior person
Vakomana	Litt. boys, popular name of the guerrillas (freedom fighters)

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Empirical research provides one with a rich picture. The sort of picture that burns in your eyeballs when you stick your nose on an impressionistic painting. If you want those red, blue and yellow dots to flip into some kind of shape, you just have to take some distance: gradually the contours of the painting emerge. The same goes for empirical research. Just take some distance in both time and space, and there you are: the contours of the thesis emerge. I guess it took me some time...

The rich picture which lies in front of you is the result of eleven years of work at an undulating pace which saw periods of frantic activity interspaced with spells of low intensity. The composition of the rich picture, which this thesis provides, involved multiple acts of mutual enrolment with many different actors, without whom the painting could not have emerged. In this sense the construction and outcome of a PhD project likens that of the process involving the crafting of a water network. Below I will briefly highlight some of the constituent elements that make up the network that underlies this thesis.

The crafting of a water network starts with an idea and an opportunity. The basic idea informing this study originated from my previous research experience in Southern India, where I had studied water distribution practices in a tail end distributary of a large scale canal irrigation scheme. The resulting MSc thesis was celebrated for the insights it provided in the daily practice of water distribution by engineers in the Irrigation Department. Yet, my own feelings about the end result were rather ambivalent. I wondered to what extent I would have been better at distributing water equitably amongst the multitude of irrigators, if I had been an irrigation engineer employed by the Indian Irrigation Department. Thus I decided that in my next research assignment I would engage with the engineers I studied, and work with them rather than just study their daily interactions as if I were a fly on the wall. The opportunity to do just that was offered to me in 1993 by the Zimbabwe Programme on Women Studies, Extension, Sociology and Irrigation (ZIMWESI). The fact that the programme was a NUFFIC inter-university exchange programme, funded by the Dutch Ministry of International Cooperation (DGIS), also provided me with a way to avoid being drafted in the national army, for which I'm thankful.

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During my intermittent stays in Mutare I lodged at the gracious home of Zona and Peter McIntyre, my foster parents in Zimbabwe. I thank them both for their warmth, love and contagious fondness of border collies, and I hope Peter will forgive the Dutch national soccer team for the crushing defeat they inflicted on the Scots in the run-up to EURO 2004.

Chimanimani will always stay in my mind as the most beautiful place on earth to live, though Ted Patterson, the maverick Australian British colonial running the Chimanimani Country Club, thought it was the most beautiful place on earth to die. Chimanimani not only harbours the most impressive communal swimming pool (Bridal Veil Falls) in Zimbabwe, it also gave me the opportunity to meet some remarkable friends. The late Frank Elias provided me with a real life example of a Rhodesian farmer. His friendship, fanatic drive to conserve the natural resources of the District, and stories and film reels on people I only knew from archival records helped me to put the white Rhodesian experience in perspective. I thank the staff of Agritex Chimanimani for adopting me as one of their own. In particular I would like to thank the officers Mugani, Chikukwa, Madondo and Ushe, and all extension workers, supervisors and supporting staff for offering me their support and friendship. The contribution to my research project by assistant District Administrator Dhliwayo and the members of the Natural Resources Committee of the Chimanimani Rural District Council is also much appreciated. Surely the greatest gift I received in Chimanimani was my acquaintance with Doctor Rodrigues Piloto. His BBC English is a joy to listen to and his friendship and story-telling capabilities are sincerely appreciated. He knows how much I value him. I'm looking forward to our next adventure in his home-country Mozambique. My involvement with the Chimanimani Ostrich Athletics Club yielded me an enriching friendship with Chester Chimbarara. I thank him for assisting me with many interviews with former Alvord trustees and providing me with some insights on the spiritual life of Zimbabweans.

I am indebted to all the farmers, government officials and other Zimbabweans who shared their working and private lives with me for very little in return. In particular I wish to express my gratitude and admiration to *Baba* and *Pamenas* Tusot in Biriwiri; the Marowa, Chirongwe and Chiambiro families in village 12 of Shinja resettlement scheme; and the Matsekete clan for granting me access to their secluded river valley. In Bumba I learnt a 'thing or two' from Lawrence Nyagwande, *Sekuru* Rwambiwa and *Mai* Godobo. In Nyanyadzi I shared many joyful moments with Sydney Chivhenge and Cornelius Kondo. It is a pity we can't have another beer at Kumboedza on a typical hot Saturday afternoon in Nyanyadzi. I value the wisdom and kind hospitality conferred to me by Kenya Dube, *Sekuru* Nyanhanda, *Sekuru* Mudyanembwa, *Sekuru* Jambaya and *Mai* Lydia Chikazhe.

After a short spell in Guinea Bissau with Wytse I returned in 1998 to my academic hide-out in Wageningen at the Irrigation and Water Engineering Group. The period that followed was marred with feelings of loss, homeliness, and a nagging yearning to be back in Zimbabwe. It was fortunate that my job as university lecturer allowed me to stay in touch with my second home through Zimbabwean MSc students. In this respect I wish to thank Mack Moyo and Conrade Zawe for bringing comfort in a difficult time. In the end it proved impossible to combine teaching and student supervision with the writing of this thesis. With pain in my heart I decided not to extend my contract and engage in the lonely struggle called thesis writing. This choice may have disappointed some in the Group, but fortunately the NWO allowed me to come back as post-doc researcher, both to the Group and Zimbabwe. I wish to

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To stick to the metaphor of the impressionistic painting, with time more red and black spots started appearing on the painting. The Zimbabwe crisis, the onslaught caused by the AIDS epidemic, and the sudden death of Kees van Straaten, my best friend, threatened to turn the painting ink black. I thank Wytse, Jons, Melle, Jens, Flip and Edwin for their support and comfort in the darkest moments and keeping me afloat amidst a sea of despair.

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Photo 1: Aerial photo of block A, Nyanyadzi irrigation scheme, 1996
(Source: Surveyor General)

INTRODUCTION: STATE INTERVENTION AND MODERNISATION

If you take a day-time flight, today, from the Netherlands across the whole of the African continent towards Southern Africa, you can time your arrival in Zimbabwe's airspace by simply looking down. The spacious, empty, undulating, seemingly pristine landscape, suddenly gives way to oddly shaped blocks of land that are scarred with lines, clustered freckles and occasional bright green rectangles made up of infinite numbers of minute squares (see Photo 1). These scars, inscribed on the belly of mother Africa, are the subject of this thesis. They are the product of state engineered attempts to modernise African agriculture: the lines representing contour ridges, the freckles regimented village outlays and the green rectangles irrigated islands of salvation in a sea of sand. James Scott, author of an influential book (*Seeing like a state*, 1998) on the folly of grandiose state engineered attempts at agricultural modernisation, would probably remark that these represented the remnants of another collapsing state having tried, in vain, to make society legible by means of an authoritarian, high modernist, large-scale attempt at social engineering. I would probably agree with him, except that I would substitute social for sociotechnical engineering, for it is the link between technical objects and social actors that makes society durable or not.

This study focuses on intervention processes in smallholder agriculture in the Nyanyadzi watershed in Manicaland, Zimbabwe. In particular it concerns itself with sociotechnical interventions that were implemented by Agritex,¹ the national extension and irrigation service, during the mid-1990s. Despite a flurry of interventions and agrarian policies directed at the intensification of agricultural production and promotion of commercial agriculture in communal and resettlement areas, agricultural production has neither raised sufficiently nor in a sustainable manner.

In this study intervention is taken as a measure to evoke a change in ordering practices of social actors, artefacts and natural elements by pursuing a model of how these three categories of actors might interrelate in a new way. Three models for agricultural modernisation are researched in detail: the model of the smallholder commercial farmer as propagated in the master farmer training programme; the model of intensive smallholder irrigated agriculture in the case of a government managed smallholder irrigation scheme; and the model of controlling water flows by means of conservation works and state management at catchment level of the Nyanyadzi river. In all three cases the outcomes produced have been disappointing to date: the master farmer programme has been ineffective in evoking widespread innovations in smallholder agriculture, the performance of the smallholder irrigation scheme has been low at high cost and finally siltation, land degradation and an increasingly fierce struggle over scarce river water have emerged in the catchment.

¹ The Department of Agricultural, Technical and Extension services. In 2002 Agritex was dismantled and subsumed in the Department of Agricultural Research and Extension.

This chapter outlines the contours of this thesis. Section 1.1 provides an overview and critique of prevalent views on state intervention and agricultural modernisation in Zimbabwe, before presenting the objectives and main question that inform this study. Concerning the most intensive form of agricultural modernisation, irrigation, the fruits and fallacies of an indigenous and state propagated paradigm are evaluated in Section 1.2. The failure of grandiose irrigation settlements in sub-Saharan Africa calls for an interdisciplinary framework of analysis for which the key concepts are presented in Section 1.3. Next, Section 1.4 introduces the agro-ecological setting and history of state intervention in Chimanimani district. This is followed in Section 1.5 by an outline of the research methodology and action research undertaken at the three hydraulically interrelated levels in Nyanyadzi river catchment. Finally a brief outline of the thesis is provided in Section 1.6.

1.1 STATE INTERVENTION AND AGRICULTURAL MODERNISATION IN ZIMBABWE

Zimbabwe is known as an interventionist state: a strongly developed, 'modern' state within the context of sub-Saharan Africa. At independence Zimbabwe was endowed with a firm industrial sector and an agrarian sector that was capable of exporting food and commercial crops (notably tobacco and meat) during good rainfall years. Its agrarian structure has, until recently, been characterised by a dual nature, a legacy of past policies of racial segregation. At the turn of the century Zimbabwe harboured a large-scale commercial farming sector, responsible for the bulk of export production, comprising some 5,000 farms on 11 million hectares of relatively good farm land (Moyo 2000, Worby 2001), and a smallholder sector, comprising an estimated one million households, operating mostly on land with limited agricultural potential held under communal or state tenure.² This study focuses on state mediated attempts to modernise smallholder agriculture, with particular emphasis on the role of water.

Zimbabwe's dual agrarian and economic structure is a direct result of the segregated nature of agrarian and industrial modernisation policies of the Rhodesian settler state. Modernisation refers to a process of development from traditionalism to modernity,³ transforming the economic, social, legal, institutional, political and ideological constitution of societies. The Rhodesian settler state pursued a policy of segregation that involved two differently paced processes of modernisation along the lines of a dual economy that was both geographically and racially separated. The African population was squeezed into (labour) Reserves to provide cheap labour for the settler economy, whilst developing their own society through a process of civilisation and agricultural modernisation. The latter aimed at the development of a permanent class of smallholder farmers that practised a combination of intensive crop and livestock production (mixed farming) in the Reserves, whilst rationalising on resource use and protecting the resource base. Those who could not be accommodated in the Reserves as agriculturists would be employed in the European industrial, mining and agricultural sectors of the country. For the European population a separate path of development was chosen where the settler state first of all captured control over the best available land and other

² By the end of the 1980s the smallholder sector comprised 16.4 million hectares in communal areas and 3.3 million hectares in resettlement areas. An intermediate category of small scale commercial farmers occupied 1.2 million hectares of free-hold land (Moyo 1995, 85).

³ Modernity is a condition or stage of development that is associated with the exercise of control over nature and society through the expansion and application of scientific and technological knowledge; the production of an industrial economic order in which the agrarian sector produces the raw material for the industrial sector; a society that is based on principles of individualism, equality and opportunity; a secular political culture that emphasises rational decision making and entrenchment of civic rights in law; and a world view that favours the role of reason and the application of scientific principles (Leftwich 2000, 33).

resources and subsequently subsidised the growth of industry, mining and agriculture in order to secure an economic basis for a sustained presence of the settlers.

In this section, I first explore the merits of an influential perspective on state intervention provided by James Scott (1998). By presenting the critical elements of state plans for modernisation some features of the agrarian history of Zimbabwe are introduced. Next follows a brief periodisation of agrarian interventions in Zimbabwe. Thereafter conventional dichotomies and continuities as well as gaps in the country's agrarian historiography are presented, which in turn inform the objectives and main question of this study.

Seeing like a state or blinded by the state?

James Scott (1998, 4-5) identifies four critical ingredients that both informed and failed state engineered plans to modernise society and improve the human condition. Below I will briefly assess to what extent these ingredients are relevant to the interventions that were undertaken by the Rhodesian/Zimbabwean state. In the process some pivotal agrarian characteristics of the country come to light.

(1) *Administrative ordering of nature and society.* Ever since the first Rhodesian settlers arrived and started carving out farm land for themselves, Zimbabwean landscapes and society have been strictly ordered, initially by a racially informed policy of geographical and political segregation. Thus communal areas, commercial areas, national parks, and urban areas acquired distinct social and ecological characters and have been subject to different administrative (tax) and governance regimes.

(2) The grand plans were inspired by a *high modernist ideology*, that postulated an uncritical, unsceptical and optimistic belief in the 'possibilities for the comprehensive planning of human settlement and production'. Scott notes that once the infeasibility of such plans dawned on its propagators, high modernism retreats in 'miniaturization: the creation of a more easily controlled micro-order in model cities, model villages and model farms'. This study engages with such a high modernist project that originated in 1920 and has influenced and shaped agrarian policies since. Basically, the state aimed at segregated modernisation seeking to substitute African traditional agricultural practices with a European intensified mixed farming model, whilst at the same time creating a reservoir (reserve) of cheap labour for the European farming and industrial sector. Surprisingly, the technocratic policies that underpinned this modernist project were continued after Independence, albeit it in a slightly modified version (Alexander 1993, Drinkwater 1991).

(3) *An authoritarian state that is willing and able to use the full weight of its coercive power to bring these high-modernist designs into being.* Both before and after independence the state turned increasingly authoritarian over time, as is most succinctly demonstrated by the forceful implementation of its most radical agrarian policies: the Land Apportionment Act (1930-), the Native Land Husbandry Act (1950-60) and the fast track land resettlement programme (2000-).

(4) *A prostrate civil society that lacks the capacity to resist these plans.* Here the Zimbabwe case deviates. The Shona and Ndebele rising (1896-7) was explicitly aimed against the land grab by the Rhodesian pioneers. The risings have become known as the first *Chimurenga* (war of independence). More than sixty years later, 'civil society', in the shape of the African nationalist movement staged a massive protest (1960-61) against the most modern piece of agrarian policy ever implemented on the African continent (the Native Land Husbandry Act), ultimately culminating in a long war of liberation (the second *Chimurenga*), that was informed by an

African nationalist thrust to regain the 'lost land', inaugurate responsible government and secure a basis for sustained agricultural production by African peasants (the 'peasant option', Ranger 1985). In Zimbabwe's relatively short life, the very failure of the post-independence modernisation project to deliver tangible benefits to a majority of communal farmers contributed to the emergence of a broad based national opposition that threatened to vote the nationalist ZANU(PF) government out of office in 2000 and again in 2002. In response the Mugabe regime has squashed civil society through the formation of a strong party state and the reformulation of the African nationalist project (Alexander 2003). This feat has been achieved at a steep price: the state modernisation project is gone, but so is the economy (Chan 2003, Meredith 2002, Worby 2001).

Scott attributes the failure of many grand state engineered plans to modernise society to the fact that the link between the ideal model (the plan) and local practice often lacks. Scott conceptualises this link in terms of *metis*, a particular kind of practical knowledge that is essential in calibrating theory with practice. In this thesis the calibration and link between intervention model and indigenous practice is a pivotal subject for investigation. However, this study also shows that often it is not the missing link (*metis*) that fails plans for agricultural modernisation, but the existence of alternative paradigms of modernisation. As will be demonstrated in the next section on irrigation paradigms (1.2) stark and incommensurate differences can be observed between imposed models for agrarian modernisation and indigenous models of agrarian production.

Scott's analytical approach to state interventions produces a number of biases that this study hopes to avoid. Many authors on Zimbabwe's agrarian history share the perspective of Scott's study. To put it bluntly they seem to suffer from the syndrome of 'seeing like a state', i.e. over-rating the role and impact of state interventions in shaping the daily livelihood struggles of the state's subjects. This bias is often reinforced by the frequent use that is made of legal documents and historical records from national archives. As Bourdieu (1996, 35) put it:

'To endeavour to think the state is to take the risk of taking over (or being taken over by) a thought of the state, that is, of applying to the state categories of thought produced and guaranteed by the state and hence to misrecognize its most profound truth (...) one of the major powers of the state is to produce and impose (especially through the school system) categories of thought that we spontaneously apply to all things of the social world - including the state itself.'

In order to avoid being blinded by the state, this study seeks to empirically scrutinise the state and its constituent elements and solicit views of the state's subjects on how they experience(d) the imposition of particular Acts and policies. Such a critical engagement raises questions on the modes of ordering that are applied by different state agents (how does the state do it?) and the room for transforming policies by both state agents and the actual subjects of these policies. It also requires an approach that goes beyond conventional dichotomies: Where does the state stop and civil society start? Where does the social stop and the natural start? Furthermore the role of the state in rural interventions is subject to changes in both local and international policy discourses (Leftwich 2000).

The dominant narrative on state intervention and agricultural modernisation in Zimbabwe
Zimbabwean agrarian historiography attributes prime importance to agrarian legislation. Up to the present, six periods can be distinguished reflecting general shifts in discourse and developmental thrust of state interventions (see table 1.1). Since the relevant debates informing the empirical material of this thesis will be discussed in detail in the individual chapters, I refrain from reviewing the full extent of the available literature here. Rather I will

briefly highlight the core legislation, policy thrust, mode of implementation and effects produced by these policies for each period.

During the first period of colonial rule under Rhodes' British South Africa company, settlers captured African land and labour inaugurating the basic modalities of the segregated development policy, which was subsequently enshrined in the Land Apportionment Act (1930). The semi-autonomous settler state of Rhodesia (1923) practised indirect rule over Africans through a partly 'invented' hierarchy of appointed Chiefs, headmen and kraalheads (Ranger 1983), whose discretions were codified in the Native Affairs Act (1927). Contrary to expectations the squeeze of Africans in semi-arid Reserves did not lead to their agricultural marginalisation. Rather the security from *Ndebele* and *Nguni* raids and the availability of commodity markets provided by the nascent settler state produced a vibrant African peasantry during the 1920s (Palmer 1977a, Ranger 1985).

Table 1.1: Periodisation of state interventions in smallholder farming in Zimbabwe

Decade	Phase	Acts
1890-1930	colonial establishment & racial segregation	1927 Native Affairs Act 1930 Land Apportionment Act
1926-1960	technocratic development policies - agricultural demonstration - conservationist policies of centralisation & destocking - yeoman peasantry in NPAs - state supervised production	1931 Maize Control Act 1933 Cattle Levy Act 1942 Natural Resources Act 1944 Good Husbandry Act 1950 Native Land Husbandry Act
1965-1980	traditionalist segregation - community development - growth points - liberation war	1967 Tribal Trust Lands Act 1969 Tribal Courts Act
1980-1991	modernist technocratic policies by a developmental state - resettlement	1979 Lancaster House agreement 1982 Growth with Equity
1991-1997	structural adjustment (ESAP) - liberalisation	1991 Land Acquisition Act
1997-	party & traditionalist politics - land invasions - destruction formal economy	1997 Compulsory Acquisition 2000 Fast track land resettlement

Source: Alexander (1993, 2003), Drinkwater (1989, 1991), Ranger (1985), Worby (2001).

This changed during the second period under review, when a combination of technocratic development policies (1926-1961) and discriminatory legislation negatively effected the pursuit of the 'peasant option' by African smallholders (Arrighi 1970, Drinkwater 1991, Ranger 1985). The Maize Control and Cattle Levy Acts of the early 1930s were designed to stem nascent African competition with European farmers and stave off an imminent collapse of settler farming in the face of the Great Depression (Palmer 1977b, Phimister 1988). Meanwhile agrarian modernisation efforts that started off with a programme of voluntary change seeking to supplant African agricultural methods with a permanent, high yielding mixed-farming model (demonstrator programme) turned increasingly coercive as a consequence of a perceived ecological disaster taking place in over-populated and overstocked Reserves (Beinart 1984). The only escape option left for African producers was to become a free-hold farmer in one of the sparsely provided Native Purchase Areas. By means of the Native Land Husbandry Act (1950) the conservationist and productive practices contained in the mixed farm model were imposed on Africans in Reserves. Widespread

resistance against the Act in 1960 and 1961 articulated African discontent over limited land holdings, low wages and limited opportunities for educational advance (Drinkwater 1989, Phimister 1993).

The African nationalist protest inaugurated a brief period of reflection (1961-64) during which paternalistic approaches towards African development were questioned, community development approaches adopted and feeble openings provided for a limited de-segregation of the land (Alexander 1993, Holleman 1969). However, after the rise to power of the Rhodesian Front and the Unilateral Declaration of Independence by Ian Smith, such plans were shelved. A traditionalist policy of community development along strict segregationist lines was pursued through the establishment of rural growth points from 1965 to 1980 (Gasper 1988). The modern African leaders that had manned largely ineffective African councils in the previous era were supplanted by propped up Chiefs organised in Tribal Land Authorities, responsible for the imposition of conservationist policies (Weinrich 1971). Meanwhile the different nationalist parties staged a long war of independence to regain the 'lost lands' and institute an accountable and responsive state (1972-80).

The Lancaster House agreement inaugurated Independence, but at the same time limited redistribution of land by the state through the imposition of the 'willing seller, willing buyer' principle. The Growth with Equity policy that was adopted in 1981 fostered the sustained growth of the commercial industrial and farming sector in order to generate revenues to supply subsidised services (education, agricultural support) to the hitherto neglected smallholder sector (Alexander 1993, GoZ 1981). A critical element in this policy was the provision of agricultural extension services to commercialise smallholder farming in communal and newly opened resettlement areas, adopting the central tenets of the mixed farming model of the previous era. The resulting 'agricultural revolution' in the smallholder sector reflected in increased maize and cotton production was mainly caused by the ample provision of credit and marketing facilities (Rukuni and Eicher 1994), and unevenly distributed, both spatially and socio-economically (Cliffe 1988, Stack 1994, Worby 2001).

After the adoption of structural adjustment policies (Skalnes 1993) a gradual liberalisation and downsizing of government departments in the agricultural sector was set in motion (1991-97), producing differential effects for smallholders. Whilst the ongoing liberalisation allowed for new players (agro-industrial companies) to enter the field of agricultural marketing and production, resulting in positive spin-offs through a surge in profitable contract farming arrangements for export crops (such as sweet peas, baby corn, tomatoes and paprika) and better prices for cotton, the closure of government operated marketing depots and concentration of service provision to areas surrounding urban markets has negatively affected smallholder producers in remote areas (Bolding *et al.* 2003, Worby 2001). The devastating droughts of 1992 and 1995 made a majority of smallholders in communal and resettlement areas dependent on drought-relief packages provided by the government.

The economic and political crisis that beset Zimbabwe after 1997 falls outside the purview of this thesis. Nevertheless I will present a short reflection on the Zimbabwe crisis in the final chapter (10.3), since the combination of violent land invasions, suppression of the opposition, and economic melt-down has produced serious implications for both the nature and viability of the state modernisation project.

Conventional dichotomies and continuities in Zimbabwean agrarian historiography

In the above presentation some persistent themes and dichotomies in the agrarian historiography of Zimbabwe come to light. First, there is the prominent role of the land question in shaping agro-political debates. Second, the emphasis of agrarian interventions by the state has been subject to recurring swings between development (production) and control (conservation); between modernity (councils) and tradition (traditional leaders); and between voluntary change (demonstration) and imposed change (Native Land Husbandry Act). Third, agrarian modernisation policies have been persistent in their belief that through intensified resource use as postulated in the mixed farming model agricultural productivity in communal areas could be raised substantially. This brings us to the fourth point of the continuity after Independence of the same technocratic agrarian policies that had elicited widespread support for African nationalism and the guerrilla war. However the framing of the debate is problematic.

As Alexander (1993) has already pointed out there is a need to qualify the impact of state interventions through the careful study of negotiation and compromise at local levels and contradictory tendencies within the Rhodesian state agencies, that evened out or at least qualify some of the dichotomies and effects ascribed to state intervention. Ranger (1978) stresses the need to look beyond the state and its policies; grounded historical work on local agricultural development is needed that combines the use of historical records with oral history.

Agricultural modernisation models in Africa have consistently focused on intensified resource use as the only way out of the low productivity, over-population, resource degradation conundrum (Allan 1965, Boserup 1970, Fresco 1986, Sumberg 1998, Wolmer and Scoones 2000). The scale of these modernisation models has steadily expanded from the small farm model (Wolmer and Scoones 2000, Woodhouse 2002) to (irrigated) settlement schemes and later still to integrated regional development plans (Ellis and Biggs 2001). However, recent research has challenged the conventional environmental wisdom underpinning these models (Leach and Mearns 1996, Scoones 1999, Tiffen *et al.* 1994). Others have pointed at the existence of alternative agrarian development models that draw their strength from a combination of indigenous knowledge and a diversity of livelihood practices (Richards 1985). African smallholders have engaged in a variety of (non)-agricultural strategies and modes of accumulation that are informed by the active participation in various networks, straddling the public and private sphere (Bernstein and Woodhouse 2002, Berry 1985, 1993). Thus alternative pathways of agrarian development and modernisation have emerged (Robins 2003, Woodhouse 2003). Lastly the dominant discourse on agricultural modernisation needs to be grounded in a local political understanding of the dynamics of agriculture in Zimbabwe. It can be argued for Zimbabwe that the overarching policy of segregated development provided the root cause for the conundrum responsible for declines in productivity of smallholder agriculture.

Very few authors so far have dwelled on the importance of the Water Question.⁴ All attention has been given to land, and almost none to the concomitant transfer and management of water. This is surprising considering the prevalent (semi) arid conditions in Zimbabwe, which make water a critical resource for agricultural production.

⁴ A notable exception is the work of Emmanuel Manzungu (see for instance Manzungu *et al.* 1999, Manzungu 2001).

Finally, there is a decided tendency to take policies at face value without scrutinising contradictions and transformations that may have occurred during their implementation as a result of the obstinate behaviour of nature (water) and fallacy of technical objects. Acts and policies do not travel very far when left to their own devices. It is notable that few studies pay explicit attention to the interplay of social actors, technology and natural resources. Social scientists have mostly taken the latter two categories at face value, black-boxed into the context upon which the play performed by social actors unfolds. Yet without these constituting elements, social actors, or policies for that matter, do not carry very far. This observation calls for an interdisciplinary approach.

Research objectives and question

This thesis hopes to fill these gaps by focusing on sociotechnical interventions that promote agricultural modernisation by means of intensified use and management of water resources in smallholder agriculture in a medium sized (800 km²) catchment in the Eastern Highlands of Zimbabwe. The objectives of this study tie in with the critical issues raised above. They are four-fold:

- Understand and explain the continuities of sociotechnical intervention models as applied in smallholder agriculture in Zimbabwe;
- Qualify the impact of state interventions by means of empirical study of sociotechnical intervention models, practices and outcomes produced by these interventions in Nyanyadzi river catchment;
- Develop an interdisciplinary understanding of water flows, management and use at field, scheme and catchment level;
- Explore the possibilities and room for manoeuvre for reforms that calibrate policy discourse with local practice.

The main research question, guiding this study, is formulated as follows:

'How did state engineered intervention models for agricultural modernisation of smallholder farming emerge and which continuities and outcomes did these models produce at three hydraulic levels (field, scheme, catchment) in Nyanyadzi river catchment?'

1.2 IRRIGATION IN SUB SAHARAN AFRICA: TWO PARADIGMS

Before engaging with the meat of the study, agrarian interventions in Chimanimani district, the fate of modern irrigation schemes on the African continent is examined, since these epitomise the zenith of state engineered attempts to modernise African agriculture. Water has played a pivotal role in attempts to intensify and modernise existing agricultural practices. The most intensive forms of agriculture practised in sub Saharan Africa entail wet land cultivation, bringing crops to water, and irrigation, bringing water to the crops.

In Africa today one can find different types of irrigation schemes and wetland agriculture that draw on some form of water management. The precise extent of irrigation is difficult to assess, though only a meagre 5 to 9% of all cultivated land is irrigated. In 1994, the total water managed area, including the area under flood recession cropping and other cultivated wetlands, was estimated to cover some 14.2 million hectares, of which some 12.2 million hectares was under proper irrigation⁵ (FAO 1995, Gleick 1998). Conventional taxonomies differentiate irrigation ventures according to their span/scale; type of water control applied

⁵ Of this 12.2 million ha, some 0.5 million ha was under spate irrigation and another 0.2 million ha under equipped wetland cultivation, leaving only 11.5 m ha under fully or partially controlled irrigation. The latter category consisted of surface (78%), sprinkler (20%) and micro or drip (2%) irrigation (FAO 1995).

(e.g. flood water cropping, stream diversion and lift irrigation); type of management and ownership of infrastructure (e.g. public or private; company, (semi-)government, community or individual); or supposed stage of technological development (e.g. simple/traditional versus modern of various levels of sophistication: surface-sprinkler-drip). For instance, in 1982 the FAO (1986) estimated that controlled irrigation in the whole of sub Saharan Africa (excluding South Africa), comprised 5 million hectares, made up of modern, large scale (>500 ha) systems (52%) and predominantly traditional, small scale systems (48%).⁶

Table 1.2: The factory scheme paradigm compared with the African indigenous irrigation paradigm

Factory paradigm	African irrigation paradigm
Plots and hydraulic infrastructure owned by government (estate)	Plots in usufruct ownership of (fe)male farmer, infrastructure owned by collective of plot owners
Scheme's economic performance pivotal	Farm output central
Settlers should be full-time irrigators	Irrigated production is one of the livelihood strategies besides livestock, rain-fed production, fisheries, non-farm income
Settlers expected to optimise agricultural output	Farmers optimise their productive activities along rationales of risk spreading and maximum labour productivity
Agricultural produce should be marketed	Only after achieving food self-sufficiency, produce is sold
Only male head of household qualifies as settler	Women work their own plots
Allocation of plots is made to households	Plot allocated to individual members of kin-group
Existing labour allocations between men and women, old and young are irrelevant	Irrigated production is subsumed in existing kin-based organisation of production and consumption
The management decides on crop patterns	Individual farmers decide on crops grown
Centralised management which is accountable to government, not to settlers	Decentralised management through leaders who are accountable to the settlers
Management allocates water to plots	Water is distributed amongst individual persons
Crop water requirement based water distribution	Rights based water distribution
Key role of efficiency of water distribution legitimises authority of technocrats	Criteria for water distribution reflect relationships of authority outside the scheme

Source: after Diemer (1990, 209-210)

Two irrigation paradigms in Africa

Diemer (1990) has dissected the irrigation sector in sub-Saharan Africa along two contrasting paradigms, of either indigenous or imposed origin. The paradigms define a coherent set of (cultural) dispositions with regard to management, technology and use of irrigation. Diemer observes sharp contrasts between indigenous farmer managed irrigation ventures as found in various locations of Eastern and coastal West Africa, and the so-called factory schemes: grand settlement schemes that were initiated and constructed by both colonial and post-colonial governments aiming at an industrial mode of irrigated production (see table 1.2). In the remainder of this thesis I will refer to the latter category of irrigation schemes as irrigation factories. In 1982, about 40% of all irrigation ventures in sub Saharan Africa fell in this category.

⁶ Of the modern, large scale sector, 61% comprised government controlled settler schemes; 20% government estates; and 19% private individuals or estates. The small-scale (<500 ha) sector comprised 8% modern community run schemes and 92% traditional schemes.

The focus of the second part of this study is on the scheme level, that is on Nyanyadzi conceived as an irrigated settlement scheme. Chambers (1969, 11-12) has empirically established the term settlement scheme, entailing a movement of population (settlement) and an element of planning and control (scheme). In his path-breaking study on settlement schemes in tropical Africa, Chambers argues that if success and failure of such schemes are to be assessed, a multi-disciplinary and diachronic approach is required.⁷ This thesis aims to do exactly that by developing an interdisciplinary perspective on the life of Nyanyadzi irrigation scheme, an approach that I will call technography (see intermezzo 1). Moreover, to bring out the specific and shared features of the Nyanyadzi case study, a comparative perspective is used. This involves a comparison with two of the best documented paradigmatic irrigation settlement schemes in sub-Saharan Africa, i.e. Mwea in Kenya and the Office du Niger in Mali.

Irrigation factories on the march

Irrigated settlement schemes arrived in the early 1920s on the African continent, the first major scheme being the Gezira, which is still the largest irrigated settlement of the continent. The schemes originated from colonial offices and were imbued with grand objectives aiming at transforming the rural social and material landscape. Often coined in the terminology of civilisation, state formation and modernisation and intensification of African agriculturally based societies, the schemes were seen as essential elements to kick start a process of (national or regional) development. The irrigation factories applied the principles of Fordism to tropical agriculture, thus constituting proto-industrial plants that would produce the raw material and food required initially by the imperial mother-country, and, later, by the newly independent industrialising state with its growing urban population. The irrigated settlements came to be seen as vessels of modernity labouring through a sea of superstition and, again later, as icons of the independent African national state. Over time, the irrigated settlement schemes have been subject to shifts in (inter)national development discourse, which in turn has affected their popularity amongst (inter)national funders and policy makers.

Chambers (1969, 18-39) distinguishes an evolution of motives in favour of settlement schemes. Early colonial settlement operations, often coined resettlement, were triggered by either political motives, such as the establishment of African Reserves in Rhodesia and Kenya, or humanitarian motives, to evacuate areas infected with sleeping sickness. No radical change of African agricultural systems was aimed for, except for the cases of the Gezira and Office du Niger, which served metropolitan interest in producing cotton, and in situations where the stability of African agriculture was at stake, e.g. drought prone areas susceptible to frequent famines. Thus the Save valley irrigation schemes in Rhodesia and Perkerra irrigation scheme in Kenya were conceived in terms of providing food security in years of drought, saving on famine relief expenditure (Chambers 1973b, Roder 1965). During the conservationist era in the 1930s and 1940s the dominant official concern was soil erosion linked to overpopulation, which in turn triggered several interventions that sought to change African agricultural practices. However, shortage of funds and qualified colonial staff kept the scale and intensity of settlement schemes at bay. This changed in the decade following the conclusion of the second World War, resulting in the first hey day of settlement schemes in Africa (Chambers 1969, Van Beusekom and Hodgson 2000).

⁷ 'Settlement schemes must be examined as wholes, including not only the developers and the developed but also land, climate, infrastructure, economic processes, and the social, political and economic environments in which they are found. Moreover, changes over time must be taken into account.' (Chambers 1969, 9)

More capital was available in both British and French colonies through the Colonial Development and Welfare Act (1940) and Fonds d'investissement pour le développement économique et social (1946) respectively. The availability of capital coincided with an expansion of administrative services and staff, and a sense that 'new and more positive policies for underdeveloped colonies were required' (Chambers 1969, 23). Three main streams of settlement schemes flowed into the continent, each associated with a different set of official ideas. Conservationists pushed settlement schemes as a means to tackle the combined problems of erosion and overpopulation, relieving pressures on densely populated and ecologically endangered areas. In Kenya and Southern Rhodesia such settlement schemes entailed the reorganisation of African land tenure (land consolidation, land husbandry act), and irrigation settlements for expelled Africans that otherwise formed a political threat to stability. A second stream of settlement schemes was oriented towards promoting group or co-operative farming, either on ideological or technical grounds.⁸ A third stream of grandiose settlement schemes reflected metropolitan interest in increasing the output of commodities to 'overcome the post-war dollar crisis and to increase the supply of (...) food-stuffs for Britain' (Chambers 1969, 27). The spectacular failure of some of the grandest schemes,⁹ especially those involving mechanised agriculture, dampened enthusiasm for settlement schemes in the late colonial era.¹⁰

Yet, the wave of independence that swept the continent in the late 1950s and early 1960s, combined with a new found belief in the capacity of development administrations and an evolutionary model of radical change through agricultural modernisation (Beusekom and Hodgson 2000, 31), led to a second hey day for settlement schemes, and irrigation in particular. This time the funding originated from international development agencies like the World Bank and the nascent conglomerate of United Nations institutions as well as bilateral aid agencies. During the 1960s and 1970s the global area under irrigation rose annually by 2%, whilst the irrigated area per person remained steady during the 1960s, rose during the 1970s, and fell ever since (Jones 1995, 30). World Bank irrigation lending became significant during the 1960s, when agricultural prices rose on the back of pessimistic scenarios of world food production.¹¹ Investment in irrigation rose dramatically during the Green Revolution days (1970s), though its emphasis shifted from hardware (dams, canals, on-farm works) to non-hardware investments (rural credit, extension, training and marketing). The continuous and substantial fall in world staple food prices, as well as the ensuing wave of criticism¹²

⁸ Co-operative settlements, such as then established in Palestine, were considered superior to individual farm improvement attempts, since they reflected the ideological flavour of ruling European socialist parties, promoted economies of scale and of level of technology and better fitted indigenous African practices of work parties thus controlling the danger of infusing 'rampant individualism' amongst African cultivators (Chambers 1969, 26-7).

⁹ Most notable amongst the failures were the Groundnut Scheme in Tanzania (Wood 1950) and the Niger Agricultural Project in Nigeria (Baldwin 1957).

¹⁰ Those schemes that survived were subsequently more sternly screened on their economic viability, resulting in the temporary halt on the expansion of African irrigation schemes in Rhodesia between 1956-67 (Chambers 1969, 30).

¹¹ The global increase in cereal production from 1962 to 1990 originated mainly from vertical expansion, i.e. through irrigation and other means of intensified land use. Only 8% of the increase in global cereal output originated from horizontal expansion (i.e. new land taken into production). For sub Saharan Africa the figures are substantially different, though in line with the global trend (i.e. 48% increase due to horizontal, and 52% increase due to vertical expansion of agriculture). The vertical intensification in rice and wheat production that began in the late 1960s, and was mainly situated in irrigated areas, has become known as the Green Revolution (Jones 1995, 29).

¹² Despite obvious reluctance on the part of the World Bank to admit failures, the direction of the criticism on irrigation can be deduced from a stream of operational directives, such as the 1978 directive on

directed at negative social, economic and environmental effects of irrigation schemes, prompted the World Bank in 1982 to lessen its emphasis on irrigation in general,¹³ whilst re-focusing on cost-recovery and rehabilitation of existing schemes.

The irrigation factories fall apart

By the end of the 1970s, early 1980s the irrigation factory 'bubble' burst. Various types of criticism were levelled, from various quarters of the academic, policy, and development community, against large-scale, bureaucratically managed irrigation settlements. Meant to act as engines of progress, triggers of modernity, and propagators of development, irrigation factories were now singled out as the perpetrators of underdevelopment, draining lethargic states of scarce resources. Irrigated settlement schemes became tainted and notorious for their low performance and negative socio-economic as well as environmental impact.

The low economic and productive performance of irrigation factories was the result of a combination of poor infrastructure, expensive and faulty design and construction, poor drainage and land levelling, unreliable water supply, low cropping intensities and yields, low irrigation efficiencies and levels of cost recovery, poorly executed operation and maintenance and general settler dissatisfaction and discontent (see Adams 1992, Barnett 1977, 1979, Kortenhorst *et al.* 1989, Moris and Thom 1990, Underhill 1984, 1990). Singled out for blame were the very monopolistic, centralised government bureaucracies managing and operating the irrigation factories, that had in previous studies (Clayton 1981, Veen 1973) been identified as critical to their success (see Adams 1990, Barnett 1984, Chambers 1973a, Moris 1987, Palmer-Jones 1981, 1983). Thus the irrigation factories drained developing countries of resources that could have been used for alternative investments in rain-fed agriculture (Moris 1987). The obvious policy reflex to these problems was to roll back the inefficient and corrupt bureaucracies in favour of settler autonomy, whilst liberalising the market to provide for hard needed incentives to produce more efficiently. Such policies proved hard to implement, since the irrigation bureaucracies actively resisted reforms that threatened to inaugurate their own downfall. The agencies often succeeded in strengthening their position through infrastructural rehabilitation projects, promising to improve efficiencies by using better technology (see Mollinga and Bolding 2004).

Unlike the miniature welfare states that the irrigation factories were meant to be (Moris and Chambers 1973), life within the confines of a scheme often proved harder than outside it. Settlers suffered from high debts, unequal distribution of benefits due to top-tail end problems in water distribution patterns, and were often worse off in terms of wealth and food security than before the onset of the settlement scheme (Barnett 1977, 1979, 1981, Saha 1982). In addition the schemes often precipitated shifts in intra-household power relations, vesting control and access to labour in the hands of the male head of household at the expense of the autonomy of women and food security of the household (Carney and Watts 1991, Dey 1982, Hanger and Moris 1973). Thus, instead of providing a secure environment for high input production, the factories often introduced an element of risk, resulting in evasion of settlers, and the development of a variety of livelihood strategies to make a living. The latter comprised investment in kin relations and off-scheme businesses, development of booming parallel markets, and expansion of the irrigated, rain-fed and livestock production

participation and project preparation; the 1980 *involuntary resettlement* directive (stipulating livelihood protection of displaced people); the 1982 *tribal people* directive; and the 1989 directives on *environment*, *NGOs*, and *disclosure of information* (see Jones 1995).

¹³ World Bank commitments on African irrigation projects dropped from some 2,800 million US dollars in 1982, to a meagre 250 million US dollars in 2001 (De Jong 2003, investment in constant 2002 US dollars).

activities outside the perimeters of the schemes (Beusekom 1990, Hanger and Moris 1973, Kater *et al.* 2000, Lees 1986, Schreyger 1984). The nascent policy response to these woes was to allow settlers to control their own decisions and activities, provide better security of tenure, and better prices for their produce through liberalisation of agricultural commodity markets.

In addition the irrigation factories produced all kinds of environmental hazards, related to health in the form of malaria and bilharzia epidemics (Klinkenberg *et al.* 2002, Korte 1973); ongoing salinisation and resultant loss of productive land (Biswas 1986); and displacement, and downstream loss of livelihood options, attributed to the construction of large dams that changed the river ecology and hydrology (Adams 1985, 1993, Cernea 1991, McCully 1996, Scudder 1989, 1991).

The storm of criticism combined with the neo-liberal and neo-institutionally informed global water policy discourse that emerged in the 1990s (World Bank 1993, Cosgrove and Rijsberman 2000), led to the gradual and sometimes abrupt demise of irrigation factories. The new policy mantra advocated drastic reforms of irrigation factories along the lines of 'more market, more users, less state, better technology'. In the process irrigation lost its status of 'privileged solution' to Africa's woes. Yet, the potential for irrigation development in Africa combined with a renewed policy emphasis on attaining food security for its rural population, still leaves some scope for irrigation on the continent (FAO 2001).

Basically, three different scenarios for irrigation development in Africa have been advocated. The first scenario favours further development of private irrigated estates by either large scale commercial farmers or transnational agro-business corporations. Such estates have a proven track record in terms of production and profitability, especially for agricultural commodities like sugar, tea, coffee, and tobacco (Adams 1990, Moris 1987). A second stream of irrigation advocates takes its tack from the 'small is beautiful' movement (Schumacher 1973) and favours development of small-scale schemes primed on existing practices and modalities contained in the African indigenous irrigation paradigm (Adams 1990). Much effort has gone into studying and 'translating' the 'secret' of farmer managed irrigation schemes into methodologies for farmer design and management of new irrigated settlement schemes (see DISC 1990, IIMI 1987, Ostrom 1992, Ubels and Horst 1993). A third stream aims to reform existing irrigation factories by means of a mixed policy recipe that favours establishment of financially autonomous irrigation service agencies (Small and Carruthers 1991, Svendsen 1993), decentralised management by establishing water users associations (Vermillion 1991, Vermillion and Sagardoy 1999), and introduction of volumetric water allocation and pricing through modernisation of irrigation infrastructure (FAO 1997, Plusquellec *et al.* 1994, Repetto 1986). The thrust of these reforms have left a mixed bag of fortunes for the three largest irrigation factories on the continent.

The Gezira scheme in Sudan, so successful in the past,¹⁴ is presently trapped in decline, draining the government of hard needed cash through a combination of continuing debts (and debt waivers), drop in production, and siltation of its canal network. After the adoption of liberalisation policies in 1992 a consortium of Sudanese Banks provided temporary financial relief until 1998, when the government had to step in again to stave off bankruptcy of the banks. In 1999, the Sudanese Gezira Board ceased to provide for agricultural inputs and

¹⁴ The Gezira had been known as 'Africa's most impressive man-made landscape' (Harrison Church 1963, 35), providing the backbone of the economy of the Sudan, without which there could have been no Sudanese independence (Kimble 1960, 190).

essential operation and maintenance services to its tenants. In turn, the dissatisfied tenants refused to pay their water rates. To save the scheme from total demise, the World Bank has advocated a strict neo-liberal policy recipe, involving rapid privatisation of the scheme and decentralisation of management and services (World Bank 2000).

An abrupt change was precipitated in the Mwea scheme in Kenya, when in 1998 the settlers refused to deliver their paddy crop to the rice mills owned by the National Irrigation Board (NIB). This set the scene for a violent take over of the scheme by the settlers organised in a cooperative society, whilst the National Irrigation Board entered a process of gradual demise. In the wake of this sudden take over and demise, the other irrigation factories in Kenya ceased to operate, since they depended on NIB funds generated in Mwea (Kabutha and Mutero 2002).

In contrast, the Office du Niger scheme in Mali has been hailed as an outstanding success after two decades of gradual reform (Aw and Diemer 2004). The reforms entailed firstly a heavily donor funded green revolution package, empowerment of settlers by means of cooperatives and rice mill associations (IOV 1992), and thorough rehabilitation of the canal network during the 1980s (Touré *et al.* 1997). The thrust of the reforms accelerated after the collapse of the Traore regime in 1992 and refusal of the settlers to deliver their paddy crop to the Office, inaugurating multi-party elections and the introduction of neo-liberal policies that favoured market liberalisation and devaluation of the CFA in 1994 (Musch 2001). In the same year the Office organisation, known as a 'state within the State', was drastically downsized and transformed into a basic service agency (Diemer *et al.* 2003). Presently both the production output and size of the scheme is larger than ever before (Kuper *et al.* 2002).

The differentiated outcomes produced by reforms of irrigation factories in the past two decades call for a careful approach towards success or failure. Rather than attributing success or failure to a singular cause (e.g. the market, the state, the farmers or the technology) or the importance of a singular discipline (e.g. economics, sociology, anthropology, or engineering science), this thesis aims to present a situated analysis of the rise and demise of one irrigation factory (Nyanyadzi scheme) from an interdisciplinary perspective.

1.3 SEARCHING FOR INTERDISCIPLINARITY: KEY CONCEPTS

Many studies on irrigation schemes try to avoid the problems and bias associated with mono-disciplinary analysis by engaging a multi-disciplinary approach. Such approaches cover the different dimensions of irrigation (ecological, economic, technical, social) separately, leaving disciplinary frameworks untouched, and then try to link these. However, such multi-disciplinary analysis produces conceptual, methodological and practical problems. Conceptual languages are difficult to marry and data-sets don't match, resulting in policy documents and projects that are divided in separate, discipline-oriented sections. In contrast inter-disciplinary approaches aim at conceptual and methodological integration and engage in the 'simultaneous analysis of the technical and the social, as different but internally related dimensions of a single object' (Bolding *et al.* 2000, 1). Interdisciplinarity invites its own kind of conceptual and methodological problems. It is particularly difficult to arrive at a sociotechnical framework of analysis, because of the ontological and epistemological problems associated with attempts to marry objectivist engineering approaches with constructivist views on social change. As a stop gap measure I have refrained from developing a whole new sociotechnical theory from the outset. Rather I have searched for hybrid concepts that integrate both the social and technical in themselves. This eclectic way

of dealing with theory reflects the process engaged at the Irrigation and Water Engineering (IWE) group to shape its sociotechnical approach towards irrigation engineering and water management (*vide* Bolding *et al.* 2000, Vincent 1997).

The transformation of the IWE Group from an agronomy/civil engineering outfit into a broader, interdisciplinary group concerned with irrigation and water resources management reflects shifts in international water discourse. Basically policy and academic discourses in the water world have moved in tandem in two over-arching directions since World War II: upwards along the hydraulic ladder and outwards in terms of disciplines that are considered relevant for the study of water management and use. Thus, whereas the geographical and hydraulic focus of irrigation research and policy was initially confined at field level during the 1950s and 1960s, the focus gradually shifted upwards against the flow of water, arriving at main system level in the 1980s (Chambers 1988, Wade and Chambers 1980), and at river basin or catchment level during the latter half of the 1990s (Adams 1992, 1999, Cosgrove and Rijsberman 2000, Newson 1997). At the same time the disciplinary focus of water research and policy broadened from an exclusive engineering and agronomy domain, to include sociology, economics, political science, management science, ecological science and others. In the 1980s the field of irrigation studies had become a multi-disciplinary affair. By the end of the 1990s integrated and interdisciplinary approaches won the favour of the day (Bolding *et al.* 2000).

My own research approach and view on the world have been shaped to a large extent by three analytical approaches that engage with the relationship between technology and society: the actor-oriented approach as developed by Long (1989a, 1992); the social construction of technology approach (Bijker, Hughes and Pinch 1987, Bijker and Law 1992) and actor-network theory (Latour 1987, Law 1994). These three schools share an approach that is non-reductionist¹⁵ and self-reflexive,¹⁶ analyses plural processes of ordering rather than assuming the existence of a single order, and emphasises process over prescription and integration over analytical separation.¹⁷ Importantly, all three approaches place great value on empirically rich analysis, summarised in the credo 'follow the actor (or actor-network)'. It is my deep conviction that the value of theory only becomes apparent through empirically grounded work. Hence, I have refrained from writing a standard chapter 2 focusing on dry theoretical debate, and opted to include two intermezzos containing conceptual reflections related to the empirical chapters. However, to provide the reader with an insight into the conceptual grids underlying my analyses in the ensuing chapters, the key concepts of this thesis are briefly discussed below.

¹⁵ Reductionism entails the *a priori* separation of causes and effects. Non-reductionism stresses the importance of relations, whilst refraining from attributing driving force to particular (f)actors beforehand.

¹⁶ This notion acknowledges that there is no reason to suppose that the researcher is different from those s/he studies. This implies that there is no need to write oneself out of the story, as you will notice.

¹⁷ The most revolutionary analytical device of Actor Network theory, the principle of general symmetry, is not shared by me or the actor-oriented approach. The principle postulates that we should not distinguish, *a priori*, between human actors on the one hand, and technical or natural objects on the other. Thus artifacts and natural objects are equally capable of acting (evoking change) as human actors are. Whilst I acknowledge that a door can act, in the sense that it can structure my behaviour (I usually try to avoid barging into it, and open it first), I strongly disagree with the view that a door can act just like me. I believe human agency differs fundamentally from the agency exerted by things. Human agents can act intentionally, for better or for worse, and things can't.

Levels and scales: flowing water

Three analytical levels are distinguished in this study: field, scheme and catchment. They are tied together and recursively organised around flowing water. In that sense water, as it moves through the hydrological cycle, is the critical actor in this thesis. Uphoff (1986, 1991) developed the notion of *hydraulic levels* to classify irrigation systems. Thus each irrigation system can be characterised by the number of levels of operation and organisation that are defined by the hierarchy of points at which water is divided and controlled. Different forms of organisation and operation in irrigation schemes can be observed as one goes up the hydraulic ladder from the field, to the tertiary unit, to the secondary canal, onto the main canal. Moving out of the irrigation scheme, water in its multiple uses in a river basin becomes salient. As one moves up these hydraulic steps one enters different planning realms that engage distinctive policy and academic fields commensurate with the increased scale. Above I have argued that policy concerns and debates in the water world have moved up from field level to the river basin or catchment level, and outwards to a multitude of academic disciplines. My approach in this study reflects this move by presenting and analysing modernisation models at the three hydraulic levels of field, (irrigation) scheme and catchment.

Sociotechnical intervention model and policy process

To grasp what happens at these three hydraulic levels, I focus on *sociotechnical intervention models*. These three terms constitute the conceptual pillars of this thesis. In this study *intervention* is defined as a measure to evoke a change in the ordering practices of social actors, artefacts and natural elements by pursuing a model of how these three categories of actors might interrelate in a new way. What is distinctive about interventions is that they intentionally aim at the re-ordering of the interrelations between society, artefacts and natural elements in a specific way. Thus they encompass a certain design, intervention ideology (De Vries 1992) or more specific a kind of model. A *model* is a specific form of representation containing a proposal for intervention in the social and material world. Models evoke a "virtual reality".

The attractiveness of models lies in their character. They tend to be discrete, computable and consistent, allowing for a view which sees the natural and social world as predictable, controllable and therefore optimisable towards a previously defined goal (Long and Van der Ploeg 1989). Mollinga and Bolding (2004, 294) identify four reasons why models fit so well within an engineering mind-set: (1) models fit the engineer's preference for blueprints and prototypes; (2) models fit the bureaucrat's disposition towards general solutions fitting a variety of cases; (3) models are part of the promise of success syndrome in the donor world, where they serve to convince decision-makers that success is possible in short time frames; (4) models suggest that there are procedural solutions to substantive issues (*cf* Vivian 1994). Crucially, models do not make the existing interplay of social actors, technology and natural resources explicit, but rather rescript (Akrich 1992) these relationships as part of a neatly executable plan.

Planned interventions by outside actors, and the models underlying them, are intricately linked with policy making, to such an extent that the terms policy model and intervention model are interchangeable. As policy making consists of complex processes of formal and less formal, legal and illegal, open and hidden interaction and negotiation of different interest groups, it needs to be treated and analysed as political processes in which many interests are at stake. This implies, among others, a critical perspective on the relation between planning and implementation (Long and van der Ploeg 1989, Thomas and Grindle 1991). Left on their

own, policies do not travel very far, and it is only in intervention practices that it becomes clear how relationships between social actors, technologies and natural resources are redefined and transformed.

Underlying this conception of policy are particular notions of human agency and the sociotechnical character of the relationship between humans, technologies and natural resources. These revolve around the view that people are knowledgeable and capable actors, active players in creating new sociomaterial environments (Rap 2004), even when they have to operate within a context that is only partially of their own making, and with motivations that are only partly conscious (Bourdieu 1977, Giddens 1984). Thus, there is not a neat linear progression from policy formulation, through implementation to the desired outcomes promised in intervention models. Rather, policy implementers and the subjects of policy (beneficiaries in donor speak) actively rework and transform policy, while technologies and natural resources are frequently much more difficult to bring in line (or translate, in actor-network theory speak) than assumed in intervention models. As intervention models interact and operate on the lifeworlds (Long 1989a&b, 1992) of social actors, and these lifeworlds are inherently sociotechnical, outcomes are emergent, contingent, and only partly attributable to the original intervention.

The above contrasts with the use of the concept of *discourse* in policy and development studies (Escobar 1995, Ferguson 1990, Foucault 1972, 1977), to capture the idea of a hegemonic (subjectless) ideology structuring the conception of problems and privileged solutions. Development discourse legitimises and steers the direction and constitution of interventions, whilst drawing on particular configurations of experts, 'scientific' knowledge, and administrative practices. Three types of criticism can be levelled against such a conceptionalisation. Firstly it leads to a rather static conception of discourse not allowing analysis of changes in discourse. Secondly it presents a subjectless, monolithic perception of discourse, denying the active contestation amongst its propagators (different administrative departments) as well as the subjects (project beneficiaries) of the intervention (Moore 2000, De Vries 1992, Worby 2000). Thirdly, it fails to analyse the technological content/matter that is associated and inculcated in development discourse. What I wish to stress in coining the term *sociotechnical intervention model* is that any intervention entails an attempt to re-order the social and material world simultaneously, either explicit or implicit.

Water-networks: durability, span and modes of ordering

An irrigation scheme can be conceptualised as a sociotechnical network of relations that ties one or more farmers, their labour and skills, a piece of land, crops, a furrow, water, and other resources, like financial capital, together into some working order. Inspired by actor-network theory (Latour 1987, Law 1994), I call these heterogeneous collectifs *water-networks*, for lack of a better word. Water is the central mobilising actor in these undertakings. The network is purposely and recursively shaped around water and its purposive use. These water-networks have a sense of order, enabling actors to take further action, further ordering the networks and their environments in the process. Water-networks are therefore recursive, emergent forms.

Water-networks espouse a number of characteristics that bear relevance to the time, space and shape dimensions of flowing water. Important in terms of space is the *span* of a water-network. Span depicts the geographical, social, material and institutional coverage of a water-network. Nyanyadzi irrigation scheme with its pumps, night storage dam, hundreds of plot holders, management staff, electricity lines and dependence on two rivers covers a wider span

than a farmer initiated irrigation furrow in Shinja resettlement scheme that is constructed and operated by a single farming family and depends for its water on a much smaller catchment and upstream population. A second characteristic is the *durability* or stability of a water-network over time. By knitting together a different combination of social and material elements a network might be able to last longer. Networks of the social are stabilised by enrolling different materials. Some materials last better than others: voices don't travel very far, bodies last longer, texts can be burned, concrete canals tend to last (Law 1994). The concept of durability or *obduracy* (Law, 2001) deals with the time dimension of the network. The strength of a water-network has to be evaluated in terms of its critical actor: water. The extent to which the water-network honours or appreciates the behaviour of water, determines its strength and usefulness. In this respect two dimensions can be discerned:

- (a) water development: to what extent does the network allow capture of the resource water?
- (b) water management: how does the network deal with situations of scarcity and abundance (floods)?

Lastly, water-networks produce particular outcomes. Of interest in this study are the effects in terms of (agricultural, industrial and mining) productivity, environmental sustainability and social equity.

During the construction of a water-network, different forms of *expertise* or knowledge claims are mobilised. The knowledge, experience and expertise necessary to predict water flow and devise some form of *water control* are critical. Government hydrologists mobilise different models on water flows than local farmers. In turn, these different models create the need for particular data sets and technical devices. This characteristic ties in with the final feature of water-networks, that is the *modes of ordering* that inform the network builders. Law (1994, 20) defines modes of ordering as 'ordering concerns, procedures, methods or logics, dreams of order perhaps, (...) performed or embodied' in a concrete, non-verbal, manner in the network of relations.' Modes of ordering are modes of self-reflexivity, implying that the ordering is evaluated, adjusted and reproduced. Thus, they are recursively shaped and often actively contested. Modes of ordering are reflected in organising practices that are largely structured by historical experiences and cultural dispositions (Bourdieu 1977) of the people that drive the networks. Whereas government administrators have a sense of due process and bureaucratic regulations, local farmers often work within the framework of kinship structures and culturally informed perceptions/logics of natural resources and their use.

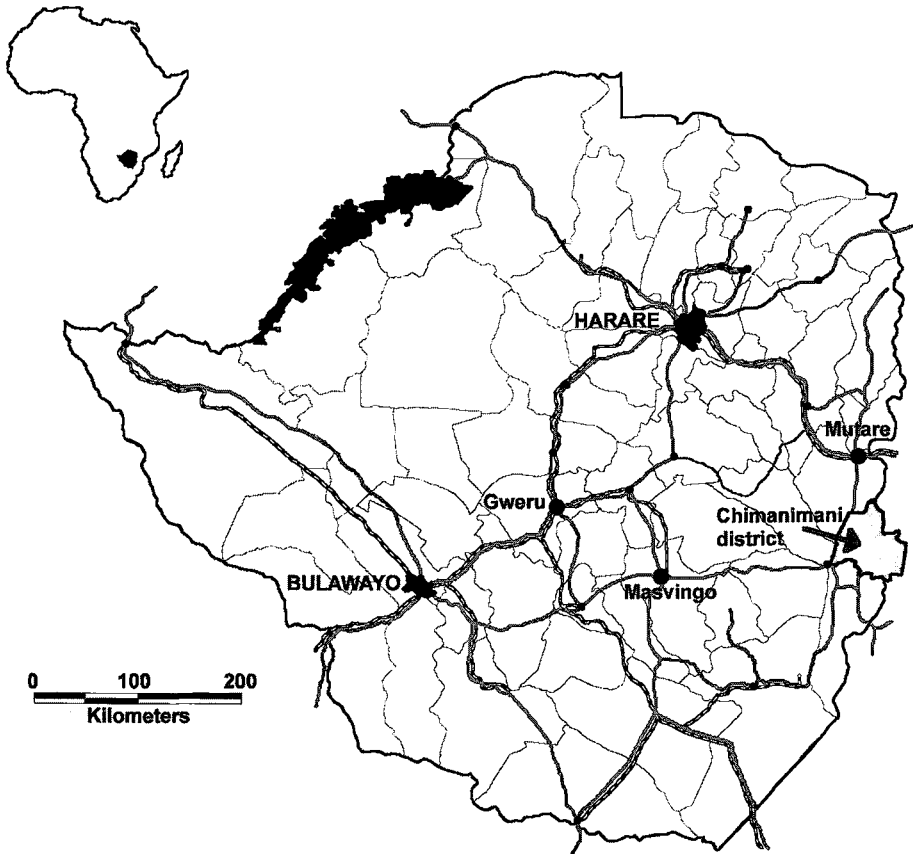
1.4 CHIMANIMANI DISTRICT: HISTORY AND SETTING

This study was undertaken in present day Chimanimani district, which is located in Zimbabwe's Eastern province of Manicaland (see map 1.1). Chimanimani, or Melsetter as it was known in the colonial era, enjoys a certain degree of fame in the agro-political history of Zimbabwe. It was one of the first districts where Rhodesia's future as an agricultural, instead of mining, state was given shape by irrigating Afrikaner *boer* settlers. The abundance of water resources played a role in this shift of direction. Triggered by the same bounty of water, Nyanyadzi irrigation scheme became the first, and according to some the most successful, experiment of modernising and intensifying African agriculture. Ironically, Melsetter district was also the first district where a white settler farmer was killed by African nationalists, in 1964, inaugurating the second *Chimurenga* (war of Independence).¹⁸ In the course of the

¹⁸ To make matters even more ironic this political murder was facilitated by the ZANU party branch of Nyanyadzi irrigation scheme. In the history of the second *Chimurenga*, as authorised by the Mugabe regime, the killing of Oberholzer in Melsetter district is downplayed, if not denied all together. The start of the second *Chimurenga* is dated at 28 April 1966 when a group of seven trained freedom fighters staged a foiled

armed struggle Melsetter district became one of the first 'liberated' areas, almost completely under control of the Mugabe led ZANLA forces by 1978, partly due to the district's proximity to Mozambique and the ruggedness of its terrain. Finally, during the March 2000 parliamentary elections, presenting the first credible challenge to the Mugabe regime, the Chimanimani seat went to a white farmer representing the opposition party, Movement for Democratic Change (MDC). Subsequently the district's population was subjected to intense repression and torture by the security forces of the Mugabe regime.

Map 1.1: Location of Chimanimani district in Zimbabwe



Before embarking on the meat of this thesis, i.e. the sociotechnical interventions that were unleashed upon Chimanimani's population after the establishment of the colonial state, first the agro-ecological and pre-colonial settings are introduced.

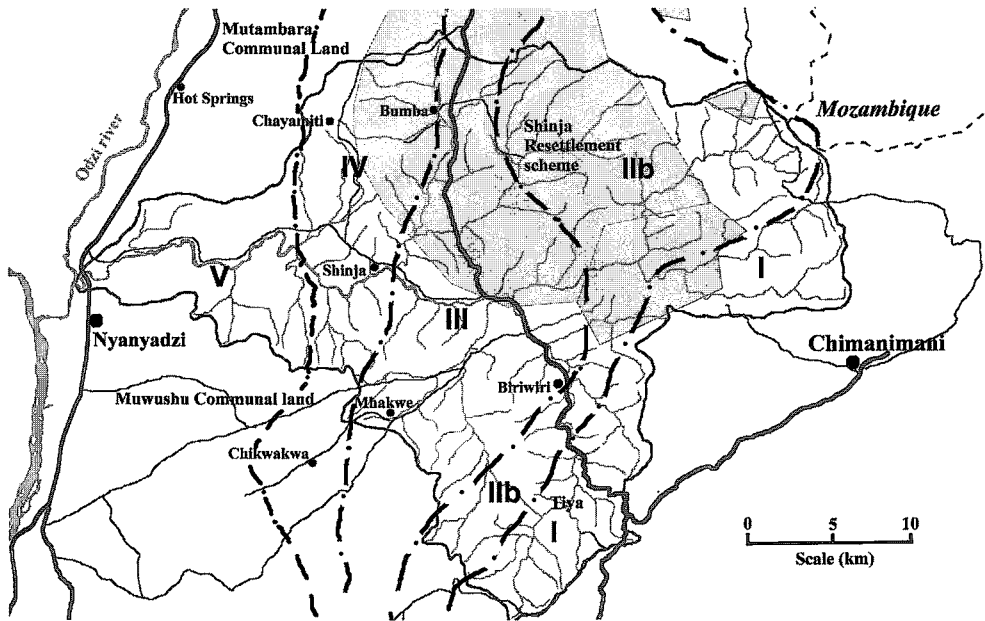
Agro-ecological setting

The Nyanyadzi river rises from the northern slopes of the Chimanimani mountains at a peak altitude of 2143 metres above sea level, flowing in west ward direction, mouthing in the Odzi

attack on the Smith regime in Sinoia (Kriger 1992, 88). The reason for this post-dating is not clear, but the fact that Sinoia (present day Chinhoyi) is located in Mashonaland, the heart of the *Zezuru* power base of Mugabe, may play a role.

river at 500 metres above sea level. The Nyanyadzi river catchment comprises some 800 km² of land. The river crosses a variety of different agro-ecological zones, characterised by high rainfall and thick climax vegetation in its upper reaches, and dry arid conditions characterised by sandy soils and sparse vegetation dominated by *baobab* trees in its lower reach.¹⁹ The average annual rainfall drops from 1114 mm in Chimanimani (highlands), to 656 mm in Biriwiri (middle veld), and 479 mm in Nyanyadzi (low veld).²⁰

Map 1.2: Natural regions in Nyanyadzi catchment



The different agro-ecological zones of Zimbabwe have been classified in five different 'natural' regions that tie in with the appropriate farming system that is promoted for each zone (Bromley *et al.* 1968, Ivy 1978, Vincent and Thomas 1957). This system of natural regions has been the basis of agricultural intervention in both the smallholder and the commercial farming sector since the late 1950s, and as such reflects the dominant mode of ordering the agricultural landscape (see box 1.1). The Nyanyadzi river catchment harbours all agro-ecological zones, except for one sub-zone (see map 1.2).

Chimanimani: pre-colonial situation

Not much is known about pre-colonial Chimanimani. Settlement of the *Bantu* people, now known as *Ndau*, started around the mid 17th century. Preceding the arrival of white settlers in 1893, the *Ndau* chiefs and their people were subjected to *Nguni* raids on women and cattle and subsequently incorporated into the Gaza state from 1830 to 1889 (see box 1.2). Below a

¹⁹ On its way down the slopes of the Chimanimani range, the Nyanyadzi river traverses heavily leached orthoferrallitic soils; moderately leached, highly erosive, sandy orthoferrallitic soils (Biriwiri, Shinja resettlement); shallow lithosols located on the Western escarpment; and colluvial soils in Nyanyadzi (DDC Chimanimani 1986; Nyamapfene 1991).

²⁰ The data ranges vary from 1899-1994 in Chimanimani; 1942-1995 in Nyanyadzi; and 1951-1991 in Biriwiri. A statistical regression analysis of the Chimanimani rainfall data shows a negative trend over thirty-year moving averages of 2.5 mm annually ($R^2 = 0.80$). The Biriwiri and Nyanyadzi rainfall data show no significant trend.

brief reconstruction is presented of the settlement, identity, economy and agriculture of the *Ndau* people residing in present day Chimanimani district.

Box 1.1: The agro-ecological classification of Zimbabwe in five Natural Regions

Natural Region I: specialised and diversified farming: High rainfall (more than 1000 mm per annum) normally spread across all months of the year. Commonly used for afforestation, fruit and intensive livestock production, as well as tea and coffee production in frost free areas.

Natural Region II: intensive farming: Rainfall is concentrated in the summer months and is moderate to high (750-1000 mm). The recommended farming system is intensive farming based on crops, and/or livestock. The zone is further sub-divided in two sub-zones (IIa and IIb).

Natural Region III: semi-intensive farming: Characterised by moderate rainfall (650-800 mm per annum) with fairly severe dry spells during mid-season. The zone is deemed suitable for mixed farming systems based on integrated crop and livestock production.

Natural Region IV: semi-extensive farming: Characterised by fairly low rainfall (450-650 mm per annum), which is subject to periodic seasonal drought and severe dry spells during the rainy season. The recommended farming system is livestock production combined with drought-resistant crops (e.g. sorghum and millet).

Natural Region V: extensive farming: The annual rainfall is low and erratic (below 600 mm annually). The region is deemed suitable only for extensive forms of cattle or game ranching.

Ndau settlement and identity

The *Ndau* comprise one of the seven clusters making up the *Shona*.²¹ They inhabit the area bound by the Indian ocean in the East, Save river in the West and South and Buzi river in the North, comprising the present Chimanimani and Chipinge district of Zimbabwe, and southern parts of Manica and Sofala provinces in Mozambique (Rennie 1973, 41). *Ndau* societal boundaries are less clear-cut. Their language, a dialect of *Shona*, can be regarded as an historical accident of having received missionary recognition.²² The word *Ndau* as a cultural definition is a 19th century ascription by the Gaza state. However, there is a political justification for using the *Ndau* as a social entity, in that they comprise in present day Zimbabwe a system of titled chieftaincies dating back to the 17th century *Bantu* Rozwi Empire. Chimanimani and Chipinge Chiefs claim a common origin in a single migration from the early Rozwi state of Mbire, presently located in Wedza, Mashonaland East.²³ These chiefs did not enter empty territory but incorporated an autochthonous population (Rennie 1973, 43-54). The introduction of cattle as bride wealth payment (*rovora*) allowed for wives to be given by one tribal group to another without the necessity of direct reciprocity. This change allowed for easier mixing of relationships between *Ndau* chieftaincies creating some form of interdependence and shared kin-networks.

Each *Ndau* chieftaincy had its own political identity, i.e. the people of Chief Mutambara were known as the *Garwe* (crocodiles), referring to their initial travel across the Save river on the back of a crocodile. Within each Chieftaincy people could be further classified into clans carrying their own totems (*mutupo*).²⁴ Within the life-world on the *Ndau* human, spiritual and

²¹ The other clusters comprise the Karanga, Zezuru, Manyika, Korekore, Kalanga, and Barwe-Tonga (Bourdillon 1982, 17).

²² See Ranger (1989) on the construction of ethnicity in Zimbabwe by well-meaning missionaries establishing their own tribal groupings by translating the Bible into the vernacular.

²³ Rennie (1973, 54-68) asserts that these Chiefs and their people established themselves in separate waves of immigration originating from the states of Mbire, Dande and Teve. Later the myth of common origin was created as an ideological device to unite the chieftaincies.

²⁴ A totem takes on a name of an animal or part of the body, which cannot be consumed by the holder of the totem. For instance a *mwoyo* (heart) totem holder is restrained from eating the heart of any animal. *Ndau*

natural beings make up one continuum.²⁵ Ancestral spirits of various kinds (*midzimu*, *mhongo* and *pfukwa*) are perceived to influence day-to-day life, and require worshipping either through ceremonial offerings or active consultation through a medium (*nganga*). Other non-kin spirit forces like spirits of the locality (*marombo enyika*), water spirits (*nzunzu*) and the High God (*mwari*) also required active worshipping (Rennie 1973, 93-106).

Box 1.2: Rise and demise of the Gaza state and its influence on *Ndau* society

A number of converging events in the early 19th century triggered the rise of the Zulu monarchy, led by *Chaka Zulu*, and the dispersal of cattle raiding *Nguni* war lords throughout central and eastern Africa. Originally *Nguni* speaking people inhabited the southern stretch of present-day Mozambique and the northern outskirts of Natal. Like the *Ndau*, the *Nguni* were patrilineal mixed farmers, though the latter relied more on the cattle economy. The start of a long series of droughts in 1790, combined with *trek boer* pressures on the system of cattle movement between sweet and sour veld, and increased European demands for cattle and ivory in exchange for worldly European commodities, put severe strains on the *Nguni* economy. The *Nguni* chiefs took to cattle raiding to replenish their herds (Newitt 1995, 257). At the same time the existing age-set groupings and traditional hunting bands making up these chieftaincies were transformed into war regiments, thus allowing the emergence of centralised, militaristic *Nguni* states. The age regiments allowed for resource control, exacting tribute (women and cattle) from subjugated tribes, as well as the smooth incorporation of conquered people into the large Gaza state. The latter emerged in the 1830s after *SoShangane* defeated two rival *Nguni* warlords, who from 1821 onwards had ventured north onto the Zimbabwe central plateau and present day central and southern Mozambique. The Zimbabwean *Ndau* chieftaincies were all subdued and seven out of ten Chiefs claim hereditary titles dating back to the early *Nguni* invasions. The political centre of the Gaza state was the king's court, which resided either in the south (at Bilene, near the Limpopo river) or in the north on the eastern slopes of the Chimanimani highlands (at Mossurize in present day Mozambique). The king ruled from his court exercising control over districts by marrying daughters of subjected chiefs and placing resident *ndunas* (councillors) at courts of local Chiefs. The *ndunas* were responsible for collecting regular tribute (tax). The Gaza state did not radically alter the *Ndau* economy. Rather it superimposed a state structure, which provided for a different type of loyalty (to a highly mobile state) than the territorial Chiefly loyalty known amongst the *Ndau*. By adopting *Nguni* culture local *Ndau* could also become *nduna* or rise through the ranks of the army (Rennie 1973, 136-47). In 1889, the third and last Gaza ruler, *Ngungunyana*, moved the centre of the Gaza state from Chimanimani to Bilene, abandoning his claim on Chimanimani and taking many of his *Ndau* followers, their families and cattle with him.²⁶ In a series of successive battles (1895-97), the Portuguese defeated *Ngungunyana* effectively ending the existence of the Gaza state.

Ndau society and agriculture

Contrary to claims of pioneer settlers, the valleys of the Chimanimani highlands and Chipinge plateau were densely populated areas when the first white settlers arrived. In the hot and dry low veld human settlement was clustered along the banks of the Odzi river and its

clan or totem names took on *Nguni* equivalents after their incorporation into the Gaza state (i.e. *Mwoyo* became *Sithole*). (Rennie 1973, 157).

²⁵ Latour (1993, 97-103) shows how the western scientific separation of Nature from Society is normally used in cultural anthropology to ascribe a pre-modern inclination to tribal cultures, like the *Ndau*. Modernity, as perceived in Western eyes, requires this scientific separation of knowledge of the world (facts and things) from the social fabric of society (culture and signs).

²⁶ The reason for this sudden move has been subject to speculation. Newitt (1995, 297, 351) describes how *Ngungunyana* became caught up in a series of negotiations between the British South Africa Company, the nascent Portuguese administration, and a hive of mineral speculators spurred on by the discovery of substantial gold deposits on the Rand. *Ngungunyana* realised the survival of his state increasingly depended on money brought back by migrant workers operating from the southern end of his territory. Incidentally, migrant labour to South Africa undermined the very fabric of the Gaza state, since labour migrants could subvert Chiefly authority by marrying wives acquired from their proceeds.

perennial tributaries flowing from the East. The *Ndau*, like other *Shona* tribal groups, were cultivators and pastoralists relying in the main on a combination of shifting dry land, and permanent wet land, agriculture (Roder 1965, 48-52). The basic pattern of shifting cultivation entailed a sequence of bush clearing, initial cultivation of groundnuts and sweet potatoes, followed by inter-cropped small grains (millets and sorghum), cucurbits (pumpkins, melons, cucumbers) and maize, and finally abandonment and fallowing. Wetlands (*matoro*) were ridged and continuously cultivated with sugarcane, rice and early maize (green mealies). In addition to these main crops a large variety of other crops were intermittently cultivated, such as cotton (for cloths), tobacco (for sniffs), tomatoes, and fruits (paw paws, pineapples, lemon) (Ibid., 54-6).

Land was allocated by the Chief or *sadunhu* (headman) of the village for individual use, though the Chief remained in formal ownership. The use of forest, water or grazing resources was not specified in terms of individual property rights. Within homesteads there was no gendered division of labour tasks. A polygamist male head of the homestead would allocate separate fields to his wives, who stored their crop proceeds in separate *hozi's* (store rooms). For most major tasks (i.e. opening up of new fields) so-called *nhimbe* or beer parties were organised, mobilising the labour of several neighbours in exchange for free home-brewed beer. The *Ndau* kept various types of livestock ranging from cattle to goats, sheep, fowl and dogs. When the first white settlers arrived few cattle were left in Chimanimani district, due to continuous *Nguni* raiding and tsetse fly infestation of the low veld. This paucity of cattle forced young men aspiring to marry to either migrate to the mines on the Rand or embark on a form of bonded labour for their prospective father-in-laws (this practice was known as *mugariri*, see Rennie 1973, 54). The further make up of livelihoods of *Ndau* comprised a variety of hunting and gathering activities, as well as five kinds of handicrafts including metal working, weaving, basket making, wood carving and pottery (Roder 1965, 63-68). The application of these livelihood strategies depended on the situation and need, i.e. during droughts more emphasis was placed on gathering of wild fruits and hunting of wild animals.

Ndau integration of upland-low land economy and flexibility

The Chimanimani *Ndau* were not heavily involved in foreign trade, lacking a strategic position for gold or ivory trade, which was concentrated along the distant Zambezi and Limpopo rivers. However, internal trade between the uplands and low veld was considerable, dictated to a large extent by the vagaries of their different environments. Frequent droughts and resultant crop failures in the low veld precipitated a dependency on the highlands for grains and tobacco.²⁷ These necessities were exchanged for salt, dried fish, palm wine, mats and blankets as well as woven cloths (Roder 1965, 68-70). Thus the local economy was flexible and highly dynamic. The intensity of hunting and gathering activities increased during droughts, whilst the varied economy of dry and wet land cultivation, supplemented by craft making provided for more than the bare necessities during ordinary rainfall years.²⁸ The on-going integration into the Gaza state resulted in some form of cultural uniformity, whilst the legitimacy of *Ndau* chieftaincies was retained. In contrast, the integration of *Ndau* society into the colonial economic system produced 'increasing division and conflict' (Rennie 1973, 158).

²⁷ The *Ndau* were renowned for their tobacco sniffing habits (Rennie 1973).

²⁸ Roder (1965, 72) attributes the absence of irrigated agriculture in *Ndau* society to a lack of an immediate need to develop irrigation considering the alternatives available for survival. This changed after the onset of settler rule.

Brief overview of sociotechnical interventions in Chimanimani district

Below a brief characterisation is presented of Chimanimani district in terms of the major sociotechnical interventions that affected and structured the livelihoods of its inhabitants. It will be shown in what way the district is unique and, in some respects, insolent of national trends.²⁹ The exact impact of these interventions on inhabitants of Nyanyadzi catchment will be dealt with in the empirical chapters that follow.

Capture of African land and labour

The settlement of the eastern boundary of Chimanimani district became part of the aftermath of the 'scramble for Africa'. Rhodes and his British South Africa Company (BSAC) was eying the Eastern Highlands, hoping to add them to his already substantial land concession granted by the *Matabele* ruler *Lobengula*. Rhodes' representative Doyle managed to wrest a land concession from *Ngungunyana* covering 'all waste and unoccupied lands' of the Gaza state in 1891. In the same year the Anglo-Portuguese Treaty moved the BSAC's eastern boundary from the Save river further east to the watershed between the Save and Buzi rivers.³⁰ Accompanying Doyle was a South African farmer, miner and freebooter by the name of Dunbar Moodie. Spurred on by the agricultural depression in the Orange Free State, Moodie organised a trek of Afrikaner *boers* to the Eastern Highlands of present day Chipinge district. The trek qualified under the 1892 BSAC land settlement scheme, though Moodie managed to negotiate double the normal land allocation of 3000 acres per family. Moodie and his lot arrived in Chipinge in 1893, carving out large farms and recruiting African labourers.³¹ Moodie's pioneer trek was followed by the Martin and Steyn treks of 1895, settling in present day Chimanimani. The absence of any form of administration in the area allowed the settlers to establish land claims and control over resident Africans which later administrators found difficult to change. The Chimanimani settlers were distinctly different from the carefully selected Mashonaland pioneers of 1890. They were mostly of *Afrikaner* origin and

'were often near-destitute debtors who had to bluster and beg to settle their commitments before they could leave South Africa. Their way of life differed hardly at all from the Africans among whom they settled. They lived in mud huts, bartered food with Africans, grew enough mealies and grazed enough cattle for their needs. They were quite marginal to the cash economy.' (Rennie 1973, 174-5)

In spite of their self-proclaimed civilising mission, many of the pioneer settlers were illiterate and few saw the need to educate their children. The new settlers competed with the resident *Ndau* over access to land and labour. The conflict was decided in favour of the newcomers through four concurrent processes, transforming the agricultural, economic and social fabric of *Ndau* society.

²⁹ Here, as elsewhere in the thesis, I bear on a number of previous (PhD) studies on different aspects of the agrarian and political history of Chimanimani district. Alexander's brilliant thesis (1993) sheds new light on the agrarian policies and rural politics of pre- and post-independence Chimanimani from 1940-1990. Roder's thesis (1965) provides a rare multi-disciplinary and critical study of the history and role of the Save valley irrigation projects in African rural development. Rennie (1973) extolls the influence of Methodist Christianity and colonialism on the origins of African nationalism among the *Ndau* people. Finally, Ndabaningi Sithole (former secretary general of ZANU) in his 1970 novel provides incisive insights in the motivation of one Nyanyadzi irrigator, Obed Mutezo, to join the nationalist cause.

³⁰ It is often claimed that the Melsetter pioneers under the leadership of Dunbar Moodie managed to secure the Eastern Highlands for Rhodes' BSAC. This is doubtful, though their settlement was instrumental in securing recognition from the British government on the validity of the BSAC land claim

³¹ Dunbar Moodie acted as the first civil administrator of the district. He was quite a crooked fellow, who pegged enormous amounts of land for himself, his family and South African land speculators. He also invented fees to extort money from his fellow settlers and embezzled substantial revenues from the BSAC (Rennie 1973, 173).

First, African ownership and occupation rights on the fertile, well watered lands above 900 metres altitude were extinguished. Contrary to the terms of the Doyle concession, the new settlers demarcated their farms in land already occupied by Africans. The first Native Commissioners (NCs) feared the collapse of African agriculture in the district and set out to secure Reserves for African occupation. These covered those places that had not yet been claimed by settler farmers and were deemed unsuitable for European occupation, i.e. the lower, drier or otherwise unhealthy areas.³² By 1900 the approximate boundaries for Mutambara and Muwushu communal areas had been laid out. The resulting racial land segregation was later legitimised by several Land Commissions (1898, 1921) and sealed in the Land Apportionment Act of 1930. In Chimanimani the process simultaneously entailed a racially informed shedding of the waters, a fact which has received scant attention in Zimbabwean historiography.

Second, control over land also gave settler farmers control over resident African labour. In line with South African custom, African tenants were required to provide on average three months of labour annually to their landlord in exchange for the right to stay on his farm. NC Hulley (October 3, 1895) described the process as follows:

'On the arrival of a farmer on his farm, he informs the natives that he has bought the farm from Government and they must work for him when called upon. He then calls upon them to make huts, make kraals, fence in lands [take] out water furrows, prepare the lands for ploughing (...) And during all the time they work at these several [tasks] they get no pay but have to feed themselves besides' (quoted in Rennie 1973, 181)

These labour arrangements were imposed by using physical force (whipping with a *sjambok*) and the threat of eviction. As a result many Africans decided to move off European occupied land.

Third, the Private Locations Ordinance, in force from 1908 to 1942, helped settler farmers to procure cheap resident labour. This Ordinance was initially drafted by the Native Department in an attempt to prevent 'harsh demands and arbitrary evictions' of African farm labour. By registering private labour arrangements and regulating minimum wages, the ordinance was also meant to stop 'kaffir farming': a common practice of 'making land profitable by allowing Africans to live on it as rent-paying tenants' (Rennie 1973, 187). The ordinance failed on both counts. Legislative representatives from the Eastern districts managed to amend the ordinance making 'non-fulfilment of the labour contract by the tenant a punishable offence' (*Ibid.*, 189).

Finally, the imposition of taxes on huts, extra wives and dogs from 1895 onwards forced Africans onto the labour market, since it was almost impossible to raise the money by sale of agricultural surplus on the European market. But instead of availing their labour to local farmers and Rhodesian miners to pay for taxes and bride wealth, many African men went to the Rand mines where higher wages prevailed. During the first world war an estimated 1,000 African men were leaving, what is presently Chimanimani and Chipinge district, annually as labour migrants. By 1920 their numbers had risen to 2,000³³ and in the 1930s between one

³² NC Meredith (1896-1908) noted in this regard that Africans were 'not so subject to fever' (Rennie 1973, 179).

³³ In 1924 the estimated total population of Chimanimani district comprised 9,203 Africans and less than 250 Europeans. Chipinge district was inhabited by another 22,526 Africans and some 500 Europeans. Source: Rennie (1973, 171, 194) and National Archives of Zimbabwe (NAZ), file S235-502, Annual report for the year 1924 by the assistant Native Commissioner for Melsetter sub-district.

sixth and one third of all tax paid consisted of remittances from men working outside the district. Circulatory labour migration has proven a persistent element in the livelihood portfolios of Chimanimani residents, particularly for those remaining in the low veld. Whilst a quarter to a third of the African population in Chimanimani and Chipinge remained resident on European land, and well under half the population stayed in the Reserves, the net result of the above mentioned interventions was a gradual movement of Africans from alienated (settler) land to unalienated (state) land to Reserves (Rennie 1973, 196-203).

Focus of government interventions on irrigation schemes

A severe drought in 1912 caused wide spread famine in the low veld. In response the NC for the first time ordered the import of grain supplies as a famine relief measure. At Mutambara, where Methodist missionaries had established an irrigation scheme, the drought precipitated a spread of irrigation furrows and gardens along rivers and streams amongst African converts and former farm labourers, beyond the confines of the Mission station (Roder 1965, 94-5). During the 1930s the colonial administration followed this example by turning to irrigation as a means to mitigate recurring famines in the low veld. In Nyanyadzi (1934), Mutambara (re-appropriated and expanded in 1936), and Chakohwa (1938) government controlled African irrigation schemes were constructed. These schemes became the central object of government intervention in Chimanimani (Alexander 1993, 15-16) as the general thrust of policy shifted over the years from an initial focus on famine relief, to squeezing as many Africans as possible in Reserves in the 1940s and 1950s, to maximising and modernising African agricultural production in the 1960s and 1970s (Hughes 1974, Roder 1965). Difficulties with recruiting irrigators and controlling production practices led to the exertion of steadily increasing amounts of government control and regulation on these unpopular islands of agricultural modernisation (Alexander 1993, Hughes 1974, Weinrich 1975).

The government bias on irrigation schemes persisted after Independence. In the mid-1990s a quarter of all Agritex Chimanimani extension staff operated in the three official irrigation schemes. In addition, three new smallholder irrigation schemes were constructed during the research period: Nenohwe (1995) to the North of Nyanyadzi and Gudyanga (1997) and Tonhorai (1998) to the South. Outside the irrigation schemes, the Water Act of 1927 and Natural Resources Act of 1941 were invoked as legal instruments to curb African furrow irrigation and *matoro* wetland cultivation. These measures affected the viability of African agriculture in Chimanimani district more than other restrictive government policies implemented countrywide during the so-called 'technical development era' (Drinkwater 1989, 1991). The Maize Control Acts of 1931 and 1934 were not implemented in the district until much later, because of the long established trade between high and low veld. Destocking never took place outside the irrigation schemes and mechanical conservation works were not enforced until the late 1960s due to severe labour shortages, caused by the high levels of labour migration out of the district (Alexander 1993, 15).

Meanwhile settler farming in the district never really took off, due to a persistent lack of basic infrastructure³⁴ to link up with national and global markets, resultant high transport rates, and the 'failure to find an economically sound pattern of farming suited to the conditions peculiar to the area' (Bromley *et al.* 1968, 11). The small measure of success achieved by settler farmers cultivating a wide variety of different crops on small (irrigated) acreages triggered a massive sale of farms during the 1940s and 1950s to Forestry companies.

³⁴ The much pressed for railway connection to Mutare city never materialised and the rugged terrain of the district inhibited construction of a permanent road until the mid-1940s, when the present Mutare-Chimanimani highway was chipped through solid rock formations by Italian prisoners of war.

By 1968, half (49%) of all timber (pine, gum, wattle) planted in Rhodesia was grown in Chimanimani (Ibid., 12). The timber industry has remained a distinctive feature of the district, providing over half the formal employment opportunities during the mid-1990s.

The Native Land Husbandry Act and the rise of African Nationalism

The Native Land Husbandry Act (NLHA) is generally considered the most pernicious and controversial piece of technocratic policy in Zimbabwe, causing widespread African resistance in 1960-61 (Drinkwater 1989, 1991, Ranger 1985). However, in Chimanimani district the Act made little impact on the ground. Implementation of the Act faced 'unusual technical obstacles' due to a lack of government interventions outside the irrigation schemes and the district's 'ecological and economic diversity' (Alexander 1993, 51). Eight implementation zones, ranging from irrigated to low, middle and high veld, were distinguished, 'each presenting its own unique problems requiring a wealth of technical and economic data' (Ibid.). As a result in much of the district, technical officials judged the Act inappropriate and stalled rigid implementation of arable land allocations, grazing permits and destocking measures. Only in Biriwiri area 82 families were forced to move (Ibid., 54). In Nyanyadzi and Mutambara irrigation schemes grazing areas were demarcated and fenced in an effort to separate irrigation from dry land agriculture, but dry land and irrigation farmers persisted in cultivating and grazing their stock in the area (Ibid., 56).

Thus the rise of African opposition in Chimanimani district, during the period of open African Nationalism (1957-1964), 'played on dynamics largely divorced from the NLHA's implementation, though it drew on the general disaffection caused by the Act. In the late 1950s, nationalist activity was concentrated in the dense settlements at irrigation schemes' (Alexander 1993, 52). As shown by Rennie (1973, 264-72) and Sithole (1968) it were the Methodist mission stations in the district that played a critical role in offering opportunities for African upward mobility, developing the 'basic conditions for nationalism'. The exact nature and origins of this opposition is examined in detail in this study. After independence, the district has maintained a persistent leaning towards opposition parties, which yielded the *Ndau* a popular reputation for being stubborn. This reputation was lived up to during the 2000 parliamentary elections, when a popular European farmer took the Chimanimani parliamentary seat on behalf of the Movement for Democratic Change (MDC).

Administrators and traditional leaders: co-optation and controversy

Chimanimani district was known as Melsetter and initially included present day Chipinge district to the south. The district boundaries shifted over time. Chimanimani was the main post of the first representative of the Native Administration, the so called Native Commissioner. In the early 1920s the main administrative centre was moved to Chipinge, and Chimanimani became a sub-division.

The Native Affairs Department relied in the main on chiefs and headmen to perform administrative tasks, such as tax collection. However, contrary to the Gaza state, both the pre- and post-independence Administrations have been unsuccessful in turning the traditional leadership into an effective governance tool. The first effort to draw up boundaries and describe chiefly authorities and the history of sub-ethnic groups was undertaken by the first Native Commissioner (Meredith 1903). The 1927 Native Affairs Act legally codified the hierarchy of chiefs, headmen and kraal or village heads and their authority, which from the start was limited to African Reserves, in line with the segregationist principles of the Land Apportionment Act (Alexander 1993, 7). Under the community development policy drive of the early 1960s a renewed attempt was made to turn the traditional leadership into an

effective administrative polity initiating African development whilst policing agricultural practices. However, the search for 'natural' communities, neatly defined in space and headed by a singular traditional hierarchy, proved difficult in the District, since communities were scattered over European farms³⁵ and across the border into Mozambique (Latham 1965). Furthermore succession struggles amongst royal heirs and political appointments by the government of Chiefs and headmen that were considered moderate or co-operative (i.e. Dzingire) as well as demotions from Chief to headman of those considered obstructive (e.g. Saurombe) negatively affected the administrative effectiveness of the traditional leadership (Alexander 1993, 146-7). The sustained resistance to the colonial administration by Chief Mutambara combined with a succession wrangle led to his dismissal and closure of the irrigation scheme in his area (Alexander 1993, Manzungu 1999). When chiefs became part of the rural administration again in the mid-1990s the District Administrator's office entered a quagmire of traditional leadership wrangles.

Chimanimani district during the mid-1990s: livelihoods and the land question

The war of independence was fierce in Melsetter, partly because of the proximity of the border with Mozambique and rugged terrain of the district, facilitating easy infiltration of guerrilla fighters. The white farming community was besieged as from 1976 and could only travel through the district in guarded convoys (Caute 1983). By 1978 the majority of white farmers had either left the district or been killed by guerrillas. Even before independence was attained in April 1980, the district was more or less run by the district ZANU party committee, that permitted groups of interested African smallholders to settle on the vacated European farms ahead of the establishment in 1983 of Shinja resettlement scheme. By that time an extensive government bureaucracy had been established in the district, responsible for the implementation of agrarian policies that closely resembled those of the past colonial era (Alexander 1995). By the mid-1990s very few commercial farms were left, a distinctive feature of the district when compared with other districts (see table 1.3).

Table 1.3: Distribution of natural regions and land use categories in Chimanimani district

Nat. Region	Communal area (ha)	Resettlement (ha)	Forestry & commercial	National park (ha)	total (ha)	proportion (%)
I	23,970	0	122,109	14,500	160,579	53%
II	12,040	15,110	9,286	0	36,436	12%
III	12,040	18,885	0	0	30,925	10%
IV	29,400	3,775	0	0	33,175	11%
V	43,680	0	0	0	43,680	14%
Total	121,130 (40%)	37,770 (12%)	131,395 (43%)	14,500 (5%)	304,795	

Source: DDC Chimanimani (1986, 10); Agritex Chimanimani fact sheet (1995).

In 1992 the district was inhabited by a population of 110,836 (CSO 1994), of which 53,162 were male and 57,674 female.³⁶ The majority (73%) of Chimanimani's population resided in one of the four communal areas, whilst their livelihood portfolios differentiated across agro-ecological zones. Those situated in the lower and drier natural regions tend to rely more on labour migration and less on agriculture for their subsistence. Cropping patterns vary according to natural region and seasonal rainfall. The dominant crop is maize intercropped with pumpkins or cowpeas, yet the district is no net exporter of maize. The Grain Marketing

³⁵ Africans residing on European land were labelled 'squatters', who lived 'in two worlds and belong to neither' (Latham 1965, 1).

³⁶ The discrepancy in the male/female ratio is due to circulatory labour migration by a part of the male population.

Board closed its rural depots in the district in 1995. Other major food crops grown in the district are sorghum, millets (*mhunga* and *rapoko*) and ground nuts. The area cultivated with these crops tends to increase at lower altitudes and after dry rain fall years. On irrigated land wheat is also a popular food crop. The main commercial crops grown by smallholders in the district are irrigated beans, peas and tomatoes, and cotton under rain-fed conditions in the resettlement area. After the devastating droughts of 1992 and 1995 a majority of smallholders depended on drought relief hand-outs distributed by Agritex. The timber and tourism industry provided the main sources of income and employment for the district in the mid-1990s.

1.5 RESEARCH METHODOLOGY AND AREA

This study was undertaken within the framework of the Zimbabwe Programme on Women studies, Extension, Sociology and Irrigation (ZIMWESI), an inter-university research project initiated and implemented by the then Wageningen Agricultural University, University of Zimbabwe and Agritex. I was the last one to join the team of researchers, consisting of one project coordinator, and six PhD students. By the time I joined, the team had firmly established itself in Manicaland in close liaison with the provincial Agritex office. During my initial months in the country in 1994 I undertook several visits with ZIMWESI team members to interesting research locations all over Manicaland. My initial aim was to study Agritex itself and the ways in which its officials intervened in smallholder agriculture. My quest for a suitable research location was solved when on May 10 the irrigation manager of Nyanyadzi irrigation scheme phoned me. He invited me to join him and his staff on an upstream raid along Nyanyadzi river to literally bring much needed water to the dry scheme and its boiled up inhabitants, leaving a swath of destructed informal irrigation furrows (see 9.1 for a graphic description of the event). This is where I developed the basic idea of this study, linking water flows, management and use at the level of an irrigation scheme to its use and abuse at catchment level, whilst at the same time considering land husbandry and agricultural practices at field level. The Chief Agricultural Extension Officer for Manicaland was very sceptical of my ultimate decision to concentrate on Nyanyadzi scheme, indicating that it was a tough place: 'If an intervention proves to work in Nyanyadzi, it will work anywhere else.'³⁷

Below I will present the major methods used in studying the intervention models at three levels. I'll present these level by level, also highlighting the *action research* activities undertaken by me, which will only receive scant attention in this thesis.

Scheme level

Nyanyadzi scheme and its irrigators form in many senses the centre pivot of this study, both defining the entry point as well as the drain pit of all the problems besetting the research area. The place is hot, dry and sandy, yet bustling with activity. The irrigation scheme is known as the oldest government scheme in the country,³⁸ initiated in 1934 by the Godfather of smallholder agriculture himself, Emery Delmond Alvord. Possibly because of its age and prime location on the main Mutare-Masvingo road, Nyanyadzi is one of the most studied smallholder irrigation schemes in Zimbabwe.³⁹ Initially, I thought of this as an advantage, but

³⁷ Only later did I appreciate that his remark was a reflection of a well founded personal frustration with Nyanyadzi scheme and its inhabitants (see 6.2).

³⁸ At a 1995 field day a local extension worker sang a song in praise of Nyanyadzi scheme, alluding to it as 'the mother of irrigation in Zimbabwe'.

³⁹ A selection of studies featuring Nyanyadzi is presented here in chronological order: Hunt (1958), Edwards (1965), Roder (1965), Gregory (1967), Mutowo (1987), Pearce and Armstrong (1990), Tiffen (1990a, b), Tiffen *et al.* (1990), Tiffen and Glaser (1990), Tiffen and Harland (1990).

after going through all the reports I could lay my hands on I was even more puzzled and confused than when I had started out.

To get a grasp of the seemingly confusing events taking place I started out by *following the actors* and observing their day-to-day interactions (Latour 1987, Law 1994). In practice this meant loitering around in the Agritex office, attending meetings, and interviewing kraalheads, various plot holders and other people that converged on Nyanyadzi and its network of canals. To get an idea of the historical evolvement of the relationship between local people and their plots, crops, canals, and houses I recorded *life-histories* of key actors (Bertaux 1981, Long 1989b). With help of two undergraduate students from Wageningen University,⁴⁰ I closely monitored the daily routines of three water bailiffs (gate keepers) as they went through the scheme negotiating and directing the flow of water to plots, crops and plot holders. By means of the *snow-ball method* I traced the social networks of Nyanyadzi plot holders and extension staff, stretching as far as Mount Darwin and Harare. Thus I got in contact with the Nyanyadzi Advisory Committee on Development (NACOD), an urban based network of sons and daughters of Nyanyadzi plot holders that try to lure donors into the scheme (see Chapter 8).

The most capricious actor, water, was also closely followed by means of *measurements* and observations. To approximate its whereabouts during the dry winter season of 1995 (see 6.3) I made use of a current metre at various critical junctions in the canal network, retrieved daily records of the Odzi river pump station and collected computerised flow data recorded by the Department of Water Development at six gauging stations on the Nyanyadzi and Odzi rivers. In addition I collected rainfall records from three meteorological stations in Nyanyadzi catchment. To refine my knowledge on the distribution of rainfall across Nyanyadzi catchment I distributed some 12 rain gauges to willing recorders. However, this effort yielded little of interest, besides confirming the high variability of rainfall in time and space, which can scarcely be quantified with such a small grid of recorders and limited time horizon (three years).

My travels in time took me to the National Archives of Zimbabwe and University of Zimbabwe library in Harare, and various Agritex offices at provincial, district and local levels. From the *records* thus collected I composed a list of critical events that took place in Nyanyadzi from its very start. To compensate for the official bias thus created I used these yearly lists and sometimes even original letters in interviews with former and present government staff and plot holders. This form of *re-study* (Seur 1992) proved helpful in reconstructing, contextualising and qualifying past events as they were recalled by key actors themselves. In the case of the critical events taking place in Nyanyadzi during the period of intense African nationalist activity (1957-1964), I read passages from Sithole's book *Obed Mutezo* to the real life actors that featured in the novel. This method elicited enthusiastic responses from these old men about their past as 'angry young men'.

From June-August 1997, at the close of my fieldwork period, I undertook two elaborate *surveys* of all plots, users, and cropping patterns in blocks A and C of Nyanyadzi scheme. Helped by two local assistants I thus tried to quantify and corroborate qualitative research findings gathered by means of the methods described above. The tracing of genealogies (Den Ouden 1981, 1989) of all *de facto* plot users in these two blocks proved very helpful in reconstructing social networks and patterns of inheritance (see chapter 7). I also undertook a

⁴⁰ These were Eric Richters and Annemarie Pijenburg. Together they produced a movie on Nyanyadzi irrigation scheme, called 'Turn it over!' (1998).

survey on the ownership of businesses operated in Nyanyadzi as well as a survey on wealth of block A plot holders using criteria developed by Roder (1965) and Tiffen *et al.* (1990). Thus I hoped to develop a *longitudinal* perspective on the relationship between irrigated agriculture and patterns of wealth generation.

The actual construction and performance of a research project likens the process of building a successful water-network. It involves processes of mutual enrolment between the researcher and his research objects, creating a network of commitment that revolves around the exchange of ideas, skills and services. The building of my own network entailed participation in Agritex in-house workshops, and various kinds of interactions with donor and other organisations, reflecting the widening web of ZIMWESI relations. The commitment created by my long-term engagement with Nyanyadzi scheme, its inhabitants and managers, saw me acting as the local Agritex driver, course lecturer for new irrigation management committees, and active negotiator and co-designer of a European Union funded infrastructural improvement project (lining of the Nyanyadzi main canal). Rather than distorting my research findings, as natural scientific method would have it, I believe this active engagement has enriched my research project, though it may have provided a certain bias to it as well.

Catchment level

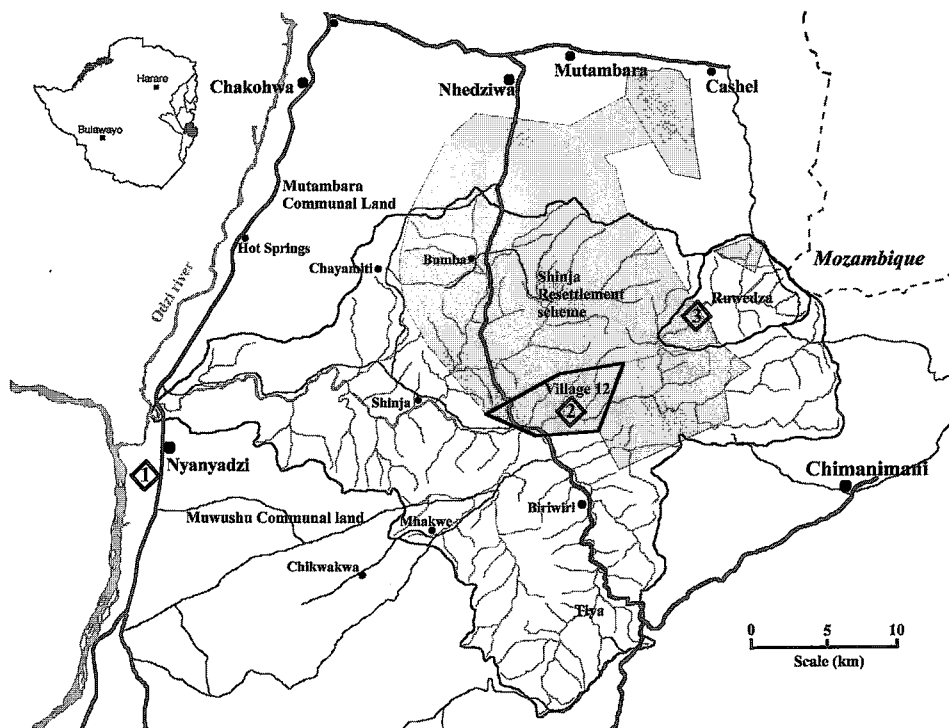
As recounted above, the upstream raid undertaken by Nyanyadzi management and irrigators shaped my awareness of Nyanyadzi catchment. Since the area is vast (800 km²) and diverse in terms of land use, agro-ecology and type of inhabitant, I concentrated my research efforts on a number of locations (see map 1.3), employing the eclectic mix of research methods outlined above.

The upstream raid was a critical event, which I analysed using the *extended case study method* (Van Velsen 1967), interviewing all key actors involved and tracing the history of upstream raids in government records and the flow records mentioned above (see chapter 9).

To study the practices of smallholders operating self initiated irrigation furrows, which were the object of destruction by the raiders, I concentrated on two locations, which were subject to different intensities of state intervention. Village 12 is part of Shinja resettlement scheme, the largest such scheme in Chimanimani district, comprising the thrust of the post-independence modernisation project. A variety of official and unofficial settlers in village 12 operates a network of seven separate, but interdependent, irrigation furrows. In tracing their origins, settlement histories and operating practices I made use of Department of Water Development farm files on the previous white inhabitants, interviews with key informants employing the genealogy perspective described above, and water measurements with a current meter. Some of the village 12 inhabitants then led me onto the secluded and rather inaccessible valley of Ruwedza river, an upstream tributary to the Nyanyadzi river. Loaded with a tent and basic provisions my assistant and I set out to follow the river water upstream, hiking across the steep mountain ridges of upper Nyanyadzi catchment to find this mystical place. Though not completely unaffected by government interventions, the valley, its inhabitants and its network of irrigation furrows form a stark contrast to the state engineered agricultural developments in village 12. Together with the son of the local headman in Ruwedza, I interviewed all users of the twenty one furrows that drew water from Ruwedza river, using a structured *survey questionnaire*. I made use of several series of *aerial photographs* obtained from the Surveyor General to map out land use practices and changes therein over time. Aerial photographs flown in 1986 and 1996, covering the whole of Nyanyadzi catchment, were also used to trace the location of a multitude of irrigation

furrows. During 1996 and 1997 I covered as many of these furrows as possible in a catchment wide *survey*.

Map 1.3: Nyanyadzi catchment and research locations



Based on an analysis of *silt load data*, collected by the Department of Water Development, Shinja resettlement scheme and Tiya area in Biriwiri sub-catchment were identified as the main areas of origin of the sand choking the river intake of Nyanyadzi irrigation scheme. A Masters student from Wageningen University (During 1995), undertook a study linking people's perceptions on environmental change to land and water use changes observed in Biriwiri valley. One of the off-springs of this work was a visit with local Agritex officers to a workshop organised by the German funded Conservation Tillage (CONTIL) project operating at Makoholi research station. At this research station farmers' innovations for soil and water conservation at field level were tested, reversing the conventional Transfer of Technology approach from scientists to farmers (Chuma and Hagmann 1995, Hagmann *et al.* 1995). Realising that engineers don't change their intervention practices by reading, but by doing, the Agritex Chimanimani office and me, assisted by funds from the Dutch Embassy in Harare, introduced the CONTIL approach of mobilising farmers' knowledge and practices in so-called *kuturaya*⁴¹ centres established in Tiya and Bumba (see Chikukwa *et al.* 1996,

⁴¹ *Kuturaya* means 'to try' in Shona. The *kuturaya* centres were established at secondary schools and comprised six demonstration plots laid out according to the prevalent slope, where local farmers' soil and water conservation practices were tried. The trials were crudely evaluated in terms of yield and run-off (contained in an empty oil drum at the bottom of the trial plot). The actual selection of trials was done on the basis of a group discussion, whereby separate female and male groups scored the methods to be tried. The success of the selected methods was evaluated at the end of each season during a group meeting.

Bolding and Nyagwande 1998). The establishment of the centres was preceded by a group excursion to Makoholi research station and to neighbouring farmers practising the approach.

The water reform process in Zimbabwe, started in 1993 and culminating in a new Water Act by the end of 1998, also provided me and my fellow Zimbabwean researchers with an opportunity to engage critically with the ongoing policy debate, in an attempt to shape future water management modalities in Zimbabwe.⁴² Spurred on by councillors of the Natural Resources Committee of the Chimanimani Rural District Council, I facilitated a visit to Nyanyadzi catchment by the Dutch project identification team looking for pilot catchments to test the organisational modalities of future catchment councils. Nyanyadzi failed to qualify (see Chatora *et al.*, 1995, 16), but the door to a network of expatriate reformers was opened. By interviewing key actors involved in the water reform process and tracing key documents, I was able to reconstruct the origins and modalities of the process. Ultimately, my critical engagement with the pilot projects embarked on yielded me a consultancy assignment for the Dutch Embassy moderating the mobilisation of communal area stakeholders for the Mupfure Catchment Council (Bolding 1998).

Another change which occurred during my fieldwork period was the sale of six commercial farms, located in the upper Nyanyadzi catchment, from a white land speculator to the Border Timbers company in 1996. This transfer of ownership was assented to by a government eager to retain its hold to power by promising more land for the people during the 1995 general and 1996 presidential elections. Border Timbers' intention of using the land for the plantation of gum and pine trees would negatively affect the dry season flow of the Nyanyadzi river, further intensifying the ongoing battle for water between informal and formal irrigators, whilst destroying the livelihoods of irrigating squatter communities located at the farms themselves. Together with a local councillor, I actively negotiated on behalf of the irrigators in the catchment for a productive trade-off (construction of a dam on the Nyanyadzi river by Border Timbers) to off-set the negative impact of the land use change. However, the network for changing the plans (comprising ZFU Nyanyadzi, furrow irrigators in village 12 and the councillor) proved too weak to make an impact (see Van der Zaag *et al.*, 2001).

The above mentioned examples of action research reflect a critical engagement with doing research (*cf* Guha 2003). Long term research exposures, besides entailing mutual enrolment processes in widening networks of relations, also offer windows of opportunity to productively *translate* research findings into shared and mutually negotiated projects, in part dictated by the researchers' critical engagement with the subject matter. Some of these projects were moderately successful, others were not. In this thesis little explicit attention is paid to these collective projects. Their exclusion from the main narrative of the thesis is not informed by a lack of desire for self-reflection but have to do with a lack of space and time to keep the thesis narrative short.

Field level

To study the composition and emergence of the model of modernisation at field level, I relied to a large extent on archival sources and government records. To compare the differences in working styles and effectiveness of past and present extension methods I conducted a semi-structured *survey questionnaire* among some 25 retired and active extension workers and officers. The in-depth interviews were also used to study and re-construct *careers* and *social*

⁴² Several workshops were held during this period, leading to various publications aimed at a policy audience (see Bolding 1999, Bolding *et al.* 1999, Manzungu 1999, Manzungu and Van der Zaag 1996a, Van der Zaag 1999).

networks of classmates (Arce 1993). To locate retired extension staff I used a *snow-ball method* relying on clues provided to me by Archival records, local farmers and extension staff. Thus I came to include retired demonstrators that were fathers to extension staff operating in Chimanimani district during the mid 1990s. My search for people who had known and worked with Alvord took me to some of his former pupils residing at nearby Mission stations and one of Alvord's sons staying in the USA, located with help of the *internet*.

My intention to follow master farmers, the performance of master farmer training, and compare agricultural practices between master farmers and non master farmers was seriously impaired by the scarcity of master farmers in Nyanyadzi catchment. Only two extension workers (in Shinja communal and Shinja resettlement area) undertook master farmer training, and only 3 master farmers were examined during the fieldwork period (1995-97). I covered these events (training and examination) as a *participant observer* (*vide* Bernard 1988). By means of *life histories* and *reconstruction of farm development patterns*⁴³ I tried to grasp the attraction and practices entailed in becoming a master farmer. I also attended many field days and agricultural shows in Chimanimani district to observe the performance of agricultural success.

1.6 ORGANISATION OF THE THESIS

The rationale of the thesis is informed by the three analytical levels distinguished above. Thus the thesis consists of three parts focusing on interventions at field, scheme and catchment level respectively. The separate parts are linked by two *intermezzos* that highlight the basic tenets of the intervention model, relationship with dominant (inter)national policy discourses, and rationale of the chapters that follow. The analysis of the three separate hydraulic levels is blended together again in the concluding chapter (10).

Part one of the thesis consists of two chapters (2 and 3) that are concerned with the emergence and persistence of a dominant model of agricultural modernisation of smallholder farming in Zimbabwe's communal areas. In the second part of the thesis (chapters 4-8) an analysis is presented on the fruits and fallacies of the Nyanyadzi irrigation settlement scheme as the model of state engineered modernisation. In *intermezzo 1* a new methodological lens (*technography*) is presented to describe and analyse the life of the scheme and the various (f)actors involved in shaping it.

The final part focuses on attempts of the state to regulate water use at catchment level. *Intermezzo 2* highlights the emergence of a new policy discourse that proposes three shifts in water governance along the lines of 'less state, more users, more market', which informed the thrust of the water reform process in Zimbabwe during the late 1990s. Chapter 9 highlights the strengths and weaknesses of two alternative water-networks that emerged in Nyanyadzi catchment during the past century. Whereas the official network, as informed by the old Water Act, was instrumental in securing access to water for Rhodesian settlers and destroying African practices of wetland agriculture during the colonial era, the emergence of an extensive network of African irrigation furrows combined with a series of droughts after independence produced intense competition over Nyanyadzi river water. Since the official network proved incapable of mediating the water scarcities thus produced, the Nyanyadzi scheme plot holders and management embarked on a series of ineffective upstream raids in

⁴³ Long (1989b, 251) prefers to refer to these as enterprise careers.

order to literally bring the water to their intake. The case of the inaccessible Ruwedza valley at the upper end of Nyanyadzi catchment demonstrates the potential offered by the indigenous irrigation paradigm to capture and manage river water in an integrated and sustainable manner. The chapter concludes by comparing the two networks that emerged in Nyanyadzi catchment and presents the potential impact that the new Water Act and institutional configuration might have in terms of calibrating water discourse with practice.

In the overall conclusion firstly the emergence, continuities and outcomes produced by the three state engineered models for agricultural modernisation of smallholder agriculture are presented. Secondly, some pointers are provided of an alternative way of analysing and crafting water-networks drawing on the strengths of an interdisciplinary network focus engrained in technography. Finally a brief interpretation of the likely impact of the Zimbabwe crisis on smallholder agriculture is given.

Note on notes

In this thesis two types of notes are used: footnotes which are printed at the bottom of the page, and endnotes which are marked with roman figures and printed at the end of the thesis, chapter by chapter. The latter notes are references to sources (either from the National Archives of Zimbabwe (NAZ), government files, or interviews conducted by the author).



Photo 2: Emery Delmond Alvord
(Source: National Archives of Zimbabwe, photo collection no.13804)



Photo 3: Plot holder with tall maize and two women with scruffy plot, 1928
(Source: National Archives of Zimbabwe, photo collection no.17619)

ALVORD'S DEMONSTRATOR PROGRAMME: THE CONSTRUCTION OF A PERSISTENT INTERVENTION MODEL¹

Emery Delmond Alvord is considered the godfather of smallholder agriculture in Zimbabwe. Surely, I came across him in many different appearances during my fieldwork. His eyes looked at me from a framed photograph when I first entered the Agritex office in Nyanyadzi (see Photo 2), his ancestral spirit seemed to haunt me when an old Nyanyadzi irrigator (mis)took me for 'one of Alvord's sons', and his name graced many of the agricultural institutes I visited and roads that I drove on in my quest to trace the origins of the master farmer training programme. In this chapter a close look is taken at the emergence of the agricultural demonstrator scheme, which has been shaped by Alvord and formed the backbone of agricultural extension in Zimbabwe. The aim of this chapter is three-fold. First of all, an historical reconstruction is presented of the emergence of a persistent sociotechnical intervention model for the development of Zimbabwe's communal areas, focusing both on its contents and its legitimising rationales. Secondly, continuities and changes in state backed agricultural development policies and agricultural extension methods are assessed for the pre-independence era. Thus popular dichotomies like modernity versus tradition, development versus control, and the use of persuasion versus coercion are contextualised. Finally, the post-independence legacy of Alvord's modernisation programme is briefly introduced.

The narrative of the chapter unfolds as follows. A Native Commissioner, by the name of Keigwin, gave the first push towards the establishment of a government agency concerned with the segregated industrial and agricultural development of the African population in its own area. His plan in 1920 led to a training scheme for African instructors who were to demonstrate improved agricultural practices in the Reserves (2.1). With the appointment of E.D. Alvord, an American missionary, in the post of Agriculturist for the instruction of 'Natives' in 1926, a more encompassing development scheme was embarked on, relying for its propagation on the concept of 'seeing is believing' (2.2). The agricultural improvement package that Alvord developed provided a radical break with existing African agricultural practices. Whilst this break was considered necessary to allow the squeeze of the African population into the Reserves and trigger an increase in productivity per unit of land, it may be questioned whether the resultant mixed smallholder farming model suits the social and ecological fabric of the Reserves (2.3). The elaboration of Alvord's philosophy of improving the livelihood of Africans led to the appointment of instructors, called demonstrators, in the fields of agriculture, community development, home industries, forestry, irrigation, livestock and conservation. These demonstrators were tasked to modernise African households and Reserves along an evolutionary path of modernisation (2.4). The Great Depression and rise of conservationist concerns in the 1930s shifted the emphasis of the demonstrator programme from livelihood improvement to the prevention of destruction of natural resources (2.5). Disappointed with the limited spread of his voluntary change programme, Alvord in the 1940s succumbed to conservationist pressures to enforce agricultural modernisation in the Reserves. The expanded agricultural bureaucracy left after Alvord's retirement in 1950, set

¹ Parts of this chapter have been published earlier in Bolding (2003).

out to impose the modernisation package by means of the Native Land Husbandry Act. However, African nationalist protests stopped its implementation in 1961, reverting the initiative over African development to traditionalist Administrators inspired by the Rhodesian Front's strict segregationist containment of African modernist aspirations (2.6).

2.1 THE KEIGWIN PLAN: SEGREGATED DEVELOPMENT (1920-26)

At the cradle of the agricultural demonstrator programme stands a famous cricketer, H.S. Keigwin. As a Native Commissioner he set out to develop a proposal for the development of 'Natives'. The Southern Rhodesia Native Affairs committee of 1910, with Keigwin as its secretary, had paved the road for more Government attention towards education and industrial development of the black masses. Hitherto education opportunities for Africans had been limited to mission schools. The education ordinance of 1899 stipulated native mission schools to devote at least two hours education to industrial training, which would transform Africans into more effective workers in basic agricultural pursuits and in the service of European employers (Atkinson 1974, 146-7). Keigwin travelled extensively and consulted many high positioned officials in the British Colonial Office before he came up with a proposal for Industrial Development of Natives in 1920: 'the Keigwin plan.'ⁱ

Keigwin proposed the establishment of institutions to train 'progressive natives' in seven industries: hides and skins; food production; rope and mat making; basket and chair making; pottery and tiles; carpentry and wagon-work; and smithing.² He wanted to help the African 'to realise a better ideal of life', which Keigwin considered his obligation as member of a privileged, 'civilised' race. His ideal contrasted sharply with what most settlers had in mind regarding African development. Africans had been located on poor soils in (labour) Reserves; were considered a backward, lazy people by nature;³ and could only be of benefit to the nation by providing cheap labour for European farms, mines and industries. The main concern for most settlers was to get the Africans to work for them. Keigwin was well aware of these sentiments and argued that by supporting the Africans to help themselves, they would in the process help the State. By means of industrial development Africans would be taught to provide things for themselves and then they would of their own free will go out to look for work to earn money to 'purchase those things they will have learned to value'. To prove his point Keigwin drew heavily from experiences with black education in the USA. There a policy of lifting the economic status of black communities resulted in a process where, in the words of Booker T. Washington, blacks had come to value education as means of dignifying labour and not as a means to escape labour (Washington 1901).ⁱⁱ

The general idea behind a native industrial school was to train progressive Africans in the above mentioned industries and send them back to the Reserves to work as instructors and set

² Underlying his vision of development were two assumptions. Firstly Keigwin assumed that it was better to develop the African among his 'own people in their villages', rather than developing and reproducing the African according to European lines and example. This implied, according to Keigwin, an emphasis on simple, primitive handicrafts close to the desires and abilities of a 'backward people'. In this process of segregated, primitive development competition with Europeans could be avoided. Secondly he believed in a concept of raising the mass ever so little rather than advance the few along European lines. The latter process would create the dangers apparently associated with 'over-education' of a few men who could then cause racial frictions by inciting the 'ignorant masses'.

³ See for instance Bevan (1924, 13) observing that 'If crops are good and their (African, AB) limited financial requirements can be met, they prefer to live in comparative idleness'. Moyo (1925, 47) considered that 'older men (...) only look forward to three things, namely, cattle, kaffir beer and polygamy. As long as he gets well with the three things mentioned above he does not worry: he is quite content'.

up small industries for the African market. With regard to food production, Keigwin noted that common African methods of agriculture (e.g. shifting cultivation) could not be sustained:

*'As the reserves get filled up, the soil is being exhausted faster than is practicable, while the extensive destruction of timber should be checked. Better methods of tillage, improvement in seed selection, more constant cultivation, proper rotation of crops and less wastage of corn in beer-making, are some of the subjects to be dealt with. One of the first needs is for an instructor, who shall go round the reserves and demonstrate with a plough what should be done.'*ⁱⁱⁱ (My emphasis, AB)

African agriculture had to be improved and intensified not only to sustain a larger population, but also to show that the Reserve lands were being put to good use. Otherwise pressure from settlers to expropriate Africans of land and demands for coercive labour arrangements and increases of taxes would be impossible to contain, maintained Keigwin. The increased food production was to be achieved by instructors who would demonstrate the proper agricultural practices to their fellow Africans. Such a scheme had worked successfully for the black population in America and also in the Union of South Africa.

After passing through the Legislative Council in 1920, Keigwin's plan was approved and Keigwin himself became the first director for the Department of Native Development. He set up the first 'industrial farm' in Chinamora Reserve, where the soils were light and sandy as in most Reserves: Domboshawa Native Industrial School. The first eleven students were drawn from mission schools and helped to construct the school buildings. In 1922 a second Government school was opened in Tjolutjo.^{iv} Keigwin wanted both schools to be training grounds for improved agricultural methods. However, the students thought otherwise. Two strikes in Domboshawa, in 1921 and 1922, and a call of protest at the Superintendent of Natives' office in Bulawayo by Tjolutjo students, all expressing the desire for more literary instruction in English, made Keigwin realise that the Africans wanted to be taught things which would 'help them to earn better wages' (Lloyd 1962, 9; see also Atkinson 1974).⁴ In 1920, the Missionary Conference of Southern Rhodesia had supported Keigwin's plan, despite Keigwin's critical remarks that missionaries had in their educational endeavours been mainly focused on mental rather than material development of Africans. But by 1922, with both government schools remaining non-denominational and highly competitive for government subsidies on African education, the missionaries lashed out at the lack of Christian education at the two schools. They maintained that they would 'rather have an uneducated Native than education without Christianity' (Lloyd 1962, 9). Keigwin replied by observing that in ten Missionary stations agricultural instruction was being neglected.^v However, in 1925, the Committee of Enquiry on Native Education recommended that Christianity was to continue to form the basis of African Education (Atkinson 1974, 171). The intimate relationship between agricultural improvement and Christian ideals was to remain part of the later demonstrator programme (see 3.1).

With the first classes of African students in school, the question arose: What would be done with the educated Africans after they had completed their training? Wilson (1923), in the first issue of the Native Department Annual, argued that the central issue of the 'Native Question' was not whether to educate the African, but how to make full economic use of the educated African for the nation's industrial development. His answer was to develop Native Reserves in such a way to meet the economic, social and political wants of the Africans, whilst

⁴ Moyo (1925, 47), a black teacher at Tjolutjo school, later confirmed this, stating that 'young men (...) go to town and work' instead of using their carpentry skills to construct modern buildings and towns in the Reserves.

avoiding competition with the Europeans.⁵ In his broad vision, Native Reserves would become attractive centres for progressive Africans, where booming activities like agriculture, crafts industries, house and road construction and schooling would take place under the guidance of Native Commissioners. Africans selected by Native Commissioners would go for training and return as enlightened practitioners and demonstrators. In January 1924, Keigwin submitted a memorandum on the training of selected Africans to 'carry out instructional work in agriculture in Native Reserves under the control of their Native Commissioners'.^{vi} After an enquiry amongst all Native Commissioners, Keigwin drew up a policy on the training of native demonstrators. The reply from most Native Commissioners was positive: sufficient suitable candidates could be found.⁶ Keigwin's policy was approved in July 1924^{vii} and at the end of the year the first 12 candidates for the two-year demonstrator course had been enrolled at both Domboshawa and Tjolotjo. The contours of the agricultural demonstrator programme started to take shape.

Candidates were selected from districts where the people were 'most progressive, and where the Native Commissioner is most interested'. The main selection criteria were good character, accepted standing amongst fellow Africans, and some form of education, 'though not too bookish'. The training was to emphasise practical demonstration skills: trainees had to work on the common school plot as well as on their own demonstration plot. Prominent in the curriculum were preparation of the land, seed selection, cultivation and early ploughing on both native crops and commercial crops like cotton and wheat. After completion of the training the demonstrators were to be administratively treated as Native messengers attached to the Native Commissioner. Concerning their work in the field, Keigwin indicated he was studying the Transkei system of demonstrators, in operation since 1916. Keigwin himself envisaged demonstrators to have a demonstration plot of themselves, which would arouse the interest of other Africans in the area, who then submit (part of) their land for the demonstrator to work on according to the principles of improved agriculture. Demonstrators were to be judged by the results in those demonstration plots.^{viii}

However, Keigwin never saw his work come to fruition. He resigned in August 1926, frustrated by a lack of co-operation on the part of the Southern Rhodesian administration, which had given in to Missionary pressure and disbanded the Department of Native Development (Alvord 1958, 10). Keigwin had failed to get 'men of the right mind towards the work for the Natives. Our staff of whites (at Domboshawa, AB) has not been of the right sort.' He felt it was time to 'lapse into obscurity for a few years'.^{ix} However, he was very pleased with the appointment of somebody he considered his best possible successor: Emery Delmont Alvord.

2.2 THE LAUNCH OF THE DEMONSTRATOR PROGRAMME

In October 1926, Alvord, a distinguished football player, was appointed Agriculturist for the instruction of Natives within the (white) Department of Agriculture. His prime task, according to the Chief Native Commissioner in his annual report of 1932, was to 'develop

⁵ In the build up of his argument, Wilson (1923, 87) refers to an industrial machine metaphor. Africans had to take part in Rhodesia's industrial fabric, as on Ford Motor Car Industries, or else 'we shall not only break the machine, but we (the Rhodesian settlers, AB) ourselves shall be buried under the debris.'

⁶ Notable exceptions to the over-all positive response of Native Commissioners were the NC for Charter, who remarked that 'natives are successful without demonstrations and will not welcome them'; NC Buhera 'natives are apathetic'; NC Bubi 'no benefit whatever will accrue to natives' and NC Sebungwe 'doubtful whether there is any use in the proposal'.

native reserves so as to enable them to carry a larger population, and so avoid, as far as possible, the necessity for acquisition of more land for native occupation.' Alvord's immediate superior, Mr Mundy, the Chief Agriculturist, had created the post of Native Agriculturist in appreciation of Alvord's work as agricultural missionary in Mount Selinda, from 1919 to 1926. Mundy had defined Alvord's principal duties as organisation of better agricultural training at mission schools and organisation of native agricultural instruction in Reserves by means of the agricultural demonstrator programme.^x Alvord himself saw the appointment as an opportunity to carry out his ideas about the development of Africans on a nation-wide scale, outside the limited confines of a Mission station.^{xi} Alvord's ideas were wide-ranging and comprehensive and taken together formed a development ideology, which pretended to be foreseeing and covering all aspects of life. Alvord's practical attitude and perseverance enabled him to carry on, where an administrator like Keigwin had been stranded.

Alvord's discovery and elaboration of the demonstration concept

During his period as agricultural missionary at Mount Selinda, Alvord had 'discovered' the merits of the demonstration concept in transforming African agriculture. Soon after his arrival, Alvord noted that the tenants on the mission farm at Mount Selinda could not maintain their 'wasteful, destructive' agricultural practice of 'shifting tillage', because of over-population. As a consequence the soils were wearing out and soil erosion became a problem. In November 1920 he started working on a six-acre school plot, practising improved methods of agriculture. Four acres were put under a crop rotation and two acres were fertilised with kraal manure. The maize crop on the manured plot produced astonishing results in April 1921. Alvord decided to hold a 'before harvest' meeting at the edge of the plot for all mission tenants to explain the merits of manuring, cultivating and rotating crops. However, to Alvord's dismay, the African audience attributed the success of the crop to 'Mtakati, Uroyi and muti' or else the 'magic of the whiteman'. Alvord reflected on this experience in his autobiography:

'It was then that I made my prodigious discovery (...) that in spite of high qualifications and experience, a white man could not teach agriculture to the superstition steeped African who attributed high crop yields to "muti", witchcraft and favour of the ancestral spirits. I concluded that it was impossible to Christianise the Africans without, first of all intellectualising their agricultural practices, so filled with superstition, ignorance, witchcraft and worship of the unknown. I must create in them wants and desires which would automatically lift them out of the sea of superstition and fear, which engulfed them. I made the discovery that the African must see things demonstrated on his own level, within his reach, by Demonstrators of his own black colour and kinky wool, and before we could successfully preach to him the Gospel of Christ, we must first preach to him the "Gospel of the Plow"' (Alvord n.d.)

And so agricultural improvement by means of demonstration became a way, not only to increase agricultural production based on a change from an extensive, shifting land use system to an intensive, permanent land use system, but also to 'civilise' and 'Christianise' the African. In June 1921 the first African Demonstrator was appointed at Mount Selinda mission farm. By the end of 1921 several tenant farmers were persuaded to conduct crop rotation demonstration plots. During the 1921-22 drought these were the only plots yielding crops in the wide surroundings of the Mission, attracting countrywide attention. In 1923 the average yield on the demonstration plots was 100 bushels per acre compared to a mere 6 bushels per acre on ordinary African plots. Alvord noted to his joy that 'natives started to believe that witchcraft and ancestral spirits had nothing to do with crop production.' (Alvord n.d.)

The astonishing results that Alvord achieved drew many Rhodesian Administrators and policy makers to Mount Selinda. It was during these visits that Alvord got to know Mundy, Keigwin, Taylor (Chief Native Commissioner (CNC) from 1923-28), Jackson (CNC from 1929-31) and the members of the Phelps-Stokes Committee on Native Education (1924-25). This committee subsequently recommended the implementation of the agricultural demonstration programme. And Mundy, as we saw, appointed Alvord in his new job as Agriculturist for Natives in 1926. The fact that by the end of 1926 the 12 demonstrators in training at Domboshawa and Tjolotjo school would complete their course compelled Alvord to set up a policy on how these demonstrators were to operate in the Reserves. He decided to resort to the demonstrator scheme that had been successful in the Transkei, Union of South Africa. In a letter to Transkei, Alvord formulated three alternative ways of deploying demonstrators and requested advice on their suitability for African instruction:

'One is to place the demonstrator on a small area of land which he will retain and work as a demonstration farm or native garden, and on which will be established demonstration plots where he can illustrate the natives of the locality the proper methods of crop culture, and, as his time permits visit and advise other natives living in the area on better farming methods.

A second alternative would be for the demonstrator to have no land of his own but to select in his area a certain native willing to give a portion of his land to be worked by the demonstrator, who would work this land for 1 or 2 years alongside the ordinarily worked land of the resident native and would then pass on to another similarly selected native farmer elsewhere in the Reserve.

A third plan is to locate the demonstrator in a reserve where he will merely go about as agricultural advisor, advising the various native farmers on better methods and showing them how to do the different operations properly, but not actually himself working any land as a demonstrator.^{xii}

The Agricultural director for Transkei recommended option two and informed Alvord of the demonstrator system that had been in operation for 11 years by then.^{xiii} The general outline from Transkei was almost literally copied by Alvord in his own policy paper, published in February 1927.^{xiv} His superior, Mr Mundy, had expressed a preference for a government demonstration farm worked by a demonstrator (option one), instead of having a demonstrator working on private land on behalf of the owner (option two).⁷ Alvord emphasised that demonstrators were supposed to work on the demonstration plots together with the owner of the plot. 'Thus the owners receive actual demonstration in methods and "learn to do by doing".'^{xv} Option three resembles the post-independence mode of operation of Agritex agricultural extension workers. The modalities of Alvord's demonstrator programme closely resemble the co-operative demonstration approach that had been developed in the USA during the first decade of the 20th century (see box 2.1).

Meanwhile Alvord noted in 1926 that 'agriculture had no place in the Domboshawa school curriculum.' The demonstrators in training knew nothing of crop rotations and the use of kraal manure, according to Alvord. He downright refused to send these men out to the Reserves, and ordered that their course be extended to mid 1927, with explicit focus on how to demonstrate improved farming to Africans in the Reserves near the two Government schools. Thus the first two 'demonstration centres' were opened up and run by the demonstrators in training. This intervention yielded Alvord his first conflict with the principal of Domboshawa school, who was more interested in developing the industrial crafts curriculum (Alvord n.d.). This was certainly not the last conflict Alvord met in his plight to improve African farming practices. A Member of the Legislative Assembly of Rhodesia had

⁷ The system favoured by Mundy was later adopted in Native Purchase Areas (small scale commercial farming areas).

Box 2.1: The development of an extension system based on demonstration in the USA^{xv}

By the end of the nineteenth century American farmers could rely on the most extensive system of agricultural information in the world. Granges (farmers' lobby groups), farmers' institutes (local study clubs), land-grant colleges, experiment stations and various farm magazines were available in every single state. Still, the predominantly 'scientific' knowledge that was disseminated by these various organisations only made an isolated impact and was of little practical value in the field.

It was left to a practical man, Seaman Knapp, to craft an approach to bridge the gap between modern agricultural science and farmer practice. In 1902 the Department of Agriculture appointed Knapp as a special agent for the promotion of agriculture in the South of the USA. Southern agriculture was known as stagnant and backward characterised by poor agricultural methods and exhausted soils due to continuous cotton and corn growing. For his agricultural improvement programme Knapp selected practical farmers as agents and not college graduates. In most cases agents met an apathetic, suspicious response. They organised a meeting through local businessmen and farmer leaders, raised a guarantee fund and then selected some of the better farmers to run a 10-acre demonstration plot. The demonstrator farmer signed a contract obliging him to follow all instructions of the agent. Agents would personally visit the areas. Field meetings were held during the growing season and at harvest time instruction was given. Besides community demonstration farmers there was a second class of co-operators who would follow advice, but rarely received visits from agents. Yields of demonstrator farmers were often ten times higher than ordinary yields. Knapp drafted ten commandments of modern farming (1904):

1. Prepare a suitable seed bed.
2. Ploughing during fall at a proper depth (8-10 inches).
3. Selection, testing and storing of seed to ensure high germination.
4. Adequate plant spacing between plants and rows.
5. Frequent, shallow cultivation during the growing season.
6. Simple crop rotation: cotton, maize, cow peas, followed by a winter cover crop.
7. Use of manures and fertilisers to rebuild soil fertility.
8. Optimum livestock production by means of pasture development and feeding.
9. Accurate record keeping to monitor profits.
10. Achievement of self-sufficiency through production of all food needs for the family and farm livestock.

Agents visited farmers, inspected demonstrations, launched other demonstrations and sometimes helped farmers with routine farm jobs. Agents lived with their farmers and were true itinerant teachers. Two distinctive farmer characteristics were exploited to the advantage of the programme: (1) farmers' sense of rivalry and competition; (2) farmers' dislike of experts and outsiders. In 1906 Knapp linked up with Booker T. Washington. The first black agent was deployed from Washington's Tuskegee Institute. By 1912, 32 black agents were working with 3,500 black demonstrator farmers and 10 to 15,000 co-operators. There were no differences between white and black farmers regarding instruction given and results achieved. Gradually the work spread over the Northern States at the initiative of local farmers, businessmen and college lecturers. Ultimately each agriculturally oriented county (district) had its own county agent, who worked as a connecting link between the sources of information (land-grant colleges) and the people. The Smith-Lever Act of 1914 formalised this system of co-operative extension for the whole of the USA.

objected to Alvord's appointment, because the post had not been gazetted, Alvord was not a British national, and he was not sufficiently qualified. Alvord had to rely on his institutional network (Mundy and CNC Jackson and Taylor) to avert immediate dismissal.⁸ After touring

⁸ Alvord himself retaliated by claiming he 'was offered employment along lines for which my whole life training has been a preparation.' Alvord further pointed out that his ancestors came from Britain and that his qualifications were very high (a Bachelors and Masters in Agriculture from Washington State University). NAZ, AL6/1/1/23-24, Letters from Alvord to Mrs Tawse-Jollie, 11 and 14 April 1927.

several Mission stations and criticising their agricultural instruction efforts, Alvord was also at loggerheads with numerous missionaries.⁹ Finally the (white) Department of Agriculture was not particularly supportive when it allocated all money set aside for Africans to Tobacco advisors (Alvord n.d.). This rendered Alvord virtually office-bound during the first year in post and can be interpreted as white administrative opposition to increased attention for African Development (*cf.* Page and Page 1991, 6). All this seemed to change after Alvord's transfer to the Department of Native Affairs in April 1927, when Alvord could finally tour the country to mobilise support for his demonstrator scheme.

Alvord's vigorous public relations campaign: seeing is believing

Alvord was anxious to convince African cultivators, missionaries and Administrators of his 'seeing is believing' approach. Under the guidance of demonstrators in training in 1925, an African cultivator (Mr Mvundhlana) in Tjolotjo had taken up the advice of winter ploughing and reaped a bumper harvest, whereas his neighbour (Mr Makothliso) reaped nothing.

'Whenever Europeans and Natives were shown the excellent crop on Mvundhlana's land, the poor crop growing adjacent to it on Makothliso's land, was pointed out as the "horrible example".'^{xvii}

The next season 14 African farmers asked for demonstrator assistance, Makothliso being one of them. The latter's field promised to reap the best harvest. Alvord increasingly promoted his work by means of narratives of 'winners and losers' and was convinced that it stimulated competition as in the above case. The rationale was that when Africans had seen a fellow African do the trick, they would start to copy from and compete with this 'winner'. Thus a multiplying effect called 'extension' would occur. Alvord made extensive use of the 'seeing is believing' principle in his public relations campaign to promote the demonstrator programme. He toured the country's mission stations from 1927 onwards showing slides on good farming with help of a stereopticon lantern at night.¹⁰ The slide shows drew big crowds and ultimately yielded Alvord the missionaries' support for his agricultural instruction programme (Alvord n.d.). Alvord also used photographs to report on the success of his demonstration techniques. Two of his publications in leading journals for Rhodesian Administrators, the Rhodesia Agricultural Journal and Native Affairs Department Annual, are littered with pictures of proud, well-dressed demonstration plot holders holding a measuring gauge in front of their tall standing maize crop on the one hand and scantily dressed 'ordinary' African farmers standing in front of their poor, stunted maize crop on the other hand (see Photo 3).

In one of these articles (Alvord 1928), entitled 'the Great Hunger', Alvord outlined the superiority of the demonstration method in convincing Africans of the benefits of good farming practices according to scientific principles.¹¹ The story was based on the experiences of one of the first agricultural demonstrators deployed in the low-veld during a long dry spell

⁹ Alvord attributed the lukewarm response of missionaries to his plans to the legacy of Keigwin's non-denominational stance. Alvord's own criticism was directed at the fact that agricultural instruction at Mutambara and Old Umtali missions was focused on irrigated agriculture, which the students were not likely to encounter in the Reserves.

¹⁰ Alvord received the slides from the agricultural extension department of the International Harvester Company (IHC). Later he was supplied with IHC slides on black farming in the southern USA, greatly improving the effect Alvord hoped to achieve: 'Because of these negro slides they give more attention than before and are not so apt to feel that it is all white men's wizardry and that they themselves cannot do such things.' NAZ, AL6/1/1/33, Letter from Alvord to G.J. Sammons, International Harvester Company, Chicago, USA, 17 February 1928.

¹¹ The story was so powerful and convincing, that the BBC in October 1940 broadcast the story in a series on 'development of British Africa' for school children in the United Kingdom. NAZ, AL6/1/1, Letter from McGregor, BBC, London, to Alvord, 7 September 1940.

in January 1928. The people of Chief Pandi had brewed beer to please their ancestors on several occasions, but no rain fell. At witts end, their 'witch-doctor' Mavudzi attributed the great drought to 'the coming of the Native Farming Demonstrator'. During a 'before harvest' meeting at the edge of the demonstration plot, the people split 'naturally' in two parties. One group consisted of *vatendi* who had taken up the teachings of missionaries and were well dressed. The other group consisted of 'spirit-worshippers, almost naked, and draped in dirty pieces of limbo or soiled antelope skin aprons.' The latter had noted that the *vatendi* had better crops than they had, which was a sign that the Agriculturist for Natives 'was angry with them for not becoming "believers", and had cast a spell upon their crops.' A heated debate ensued between the two groups: the "believers" trying to convince the others that the success of their crop was a direct result of good advice of the Agriculturist. By then Alvord arrived and promised to explain the secret of the demonstration plot mealies in a nearby ox-kraal. Here everybody saw that mulched kraal manure contained a lot of moisture. Alvord explained that he didn't make rain clouds in ox-kraals, but that the mulch stover prevented the sun from 'drinking up the moisture.' Taking his audience back to the maize field, Alvord went on to ask:

'You can see with your own eyes what these mealies are, and you can touch them with your hands. Do you now believe it is possible to grow mealies like this?' (Alvord 1928, 42)

Everybody did and was surprised to find moisture under the loose soil in the maize field. Yet, when Alvord asked why the moisture was there, he was accused of witchcraft. Alvord reacted furiously:

'No! You are wrong. There was no witchcraft here. A white man had nothing to do with this field. It was prepared and planted by your Native Farming Demonstrator, a man with black skin and woolly hair, just like your own. He did not make rain. He only followed the simple rules of good farming, which you in your superstitious ignorance have not learned.' (Alvord 1928, 42)

Alvord proceeded by explaining the good principles of farming. The 'following season there were scores of disillusioned natives begging the Demonstrator to do plots for them.'

Alvord's well-orchestrated public relations campaign resulted in a government decision to support the scheme even further. A circular letter from CNC Jackson,^{xviii} in April 1927, calling for more candidates for demonstrator training, produced a greater number of pupils than could be absorbed at Domboshawa school.^{xix} After their final examinations, by July 1927, the first 12 demonstrators had been sent out to selected Reserves. The selection criteria that Alvord used to place a demonstrator were progressive attitude of local African farmers, a supportive Native Commissioner, and affinity of the Demonstrator with the local people. Alvord would then introduce the demonstrator to the community with help of the local Native Commissioner. Alvord further paid frequent visits to the Demonstrators in the field to supervise their work.

Not all demonstrators were as successful as the one who had inspired 'the Great Hunger' article. In Chiweshe Reserve, demonstrator Philimon failed to make any impression. In June 1927, during an initial visit, Alvord had observed the eagerness of the local African farmers to advance in farming. Alvord attributed their high standards of farming to the example of the white farmers in the neighbouring Mazoe valley. The Chiweshe people:

'displayed greater enthusiasm for availing themselves of the services of the Native Farming Demonstrators than has been evident at any other Reserve where demonstrators are being located, and their chief concern was that they could not all of them have a plot under the direction of the demonstrator.'^{xx}

But first impressions can be deceptive. By November 1927, this enthusiasm had turned sour and the work of Philimon had amounted to 'little less than a failure.' The blame was with the local people:

'They have been as continual beer drinking for the past three months and the demonstrators can get no assistance in the way of oxen or help for other operations required. Under our demonstration scheme the work is entirely dependent upon the cooperation of kraal owners with the demonstrators. The people seem to have no confidence in us and are suspicious that there is a catch in the free advice we offer.'^{xvi}

In May 1927, Chief Nhema of Selukwe Reserve had been more explicit on the 'catch' he suspected. At the start of the demonstrator programme in Selukwe, Chief Nhema rose and

'harangued his people, warning them not to believe or follow. This was only a scheme of the Government to test their land. If they found it was good, they would take it away and give it to the whitemen.' (Alvord, n.d., 15)

Still Alvord could call the first year of actual demonstration work 'more successful than we had hoped for.'^{xvii} The suspicions remained a feature of the programme throughout its first ten years. Before an account is given of the expansion of the demonstrator programme, a closer look is taken at the agricultural practices that comprised the backbone of the package.

2.3 THE ALVORD PACKAGE REVIEWED

Alvord's improvement package of crop rotations, heavy manuring, use of improved seed, weeding, ploughing and mono-cropping reflected the contemporary standards of highly productive agriculture in the West (Europe and USA). And highly productive it proved to be! The average crop yields on demonstration plots exceeded ordinary African yields by a factor 8 and European yields by a factor 1.5, if we may believe the yield data supplied by Alvord and his demonstrators.¹²

These results seemed to pay tribute to prevalent ideas of Western superiority and disregard for the merits of African methods of agriculture. Denouncing African agricultural methods had become a favourite hobbyhorse for Rhodesian Administrators and missionaries in the 1920s. Typologies of African methods of shifting tillage as 'destructive', 'wasteful' and 'inefficient' were rife (see Alvord 1930, 1950, 1958; CNC annual reports 1915-1930). The image of African agriculturists was even worse. They were regarded as an unwanting, lazy, beer drinking lot (Alvord, 1930). These conceptions successfully painted an image of 'decline' as far as African agriculture was concerned. However, Palmer (1977a) and Ranger (1985) have shown that African agriculture reached a peak of productivity in the late 1920s, as a result of the increased security offered by the settler state against *Ndebele* raids and the emergence of new market opportunities. The eager response of African farmers to new opportunities points at a highly dynamic and vibrant peasantry.

Debating the superiority of agricultural modernisation over African indigenous practices

At the heart of this apparent contradiction lie differences in perceptions and interests regarding agricultural development of the African peasantry in the Reserves. Whereas African agricultural practices capitalised on extensive land use, maximising returns per unit

¹² Average yields in ton/ha over the period 1927-1949 were 2.2, 1.3 and 0.3 for demonstration plots, Europeans and ordinary Africans respectively. The European yield data were provided by Weinmann (1975), the other yield data by Alvord in his annual reports. Ordinary African yields were based on visual estimates made by demonstrators.

of labour, the demonstrator programme sought to maximise output per unit of land through intensified production. Whereas African methods aimed at risk reduction and were based on an appreciation of local variations in soil quality and rainfall, Alvord and his European colleagues sought to develop a uniform standard of farming based on rationalisation of land use and vindication of drought hazards by the systematic application of 'scientific' methods. The latter involved a radical break away from African methods in favour of European styled techniques propagating continuous cultivation of the soil as practised in the moderate climates of the Northern hemisphere (*cf* Richards 1985). African agriculture, it was believed, required rigorous modernisation. The idiom of racial segregation and growing political importance of land apportionment as the corner-stone of the settler state necessitated changes in the prevalent African system of intensive wetland cultivation combined with extensive shifting cultivation of dry lands (McGregor 1991, Mtetwa 1976).

However, a second school of thought proposed an alternative transformation of African agriculture by learning from African knowledge and experience, accumulated over centuries of adaptation and adjustment to difficult environments (Floyd 1960, 287-89). This school maintained that the slogans of modern agriculture had to be questioned and local systems evaluated on their merits before imposing alien concepts of farming (Allan 1945, 1949, Floyd 1960, Hailey 1938, Richards 1985, Worthington 1938). An early proponent of this school was Dr Shantz (1923) who hailed existing African systems of agriculture by pointing at the advantages of land fallowing; the fact that the rotation of land ensured the availability of new rich soil; the effective way of dealing with soil fertility and plant diseases; and the fact that the practice of burning added a considerable quantity of mineral fertiliser in a short time.¹³

Taylor (1925) and Alvord (1929) both studied, to some extent, the merits of prevalent African agricultural methods, but were quick to discard them. Taylor (1925, 88-89) singled out five African practices in particular. He observed the planting of a variety of crops on different patches of soil, inter cropping, staggered planting, burning during clearance of new land, and ridging. However, as top Administrator for Africans in Rhodesia, Taylor was interested in sealing off future African demands for more land by stressing the unsustainability of prevalent African agricultural practices and promising that 'improved agriculture' could cope with the needs of the African people from the land that was specifically set aside for them: the Reserves. The potential of Alvord's package to enable Reserve land to carry a larger African population, became the main reason for support for the demonstrator scheme by Native Commissioners and top Rhodesian administrators.

Alvord (1929) noted that Africans could tap from a 'remarkable variety of foods', by cultivating seven grass family crops, three legumes and twelve other crops as well as relying on a great variety of wild plants, fruits and animal foods in times of drought. Despite this high level of sophistication, Alvord ruled the African system as primitive and destructive. Alvord's mission was one of civilisation and providing better livelihoods through agricultural modernisation.¹⁴ From the first survey on agriculture in the Reserves Alvord produced

¹³ Taylor (1925), CNC from 1923 - 1928 and supporter of the demonstration programme, reviewed Shantz' book and systematically discarded these advantages. In Taylor's view the inherent infertility of Rhodesian soils rendered fallowing a waste of efforts. Virgin land still yielded less than a well-cultivated permanent garden. Modern, intensive agriculture could overcome the dual problems of loss of soil fertility and plant diseases. And finally natural processes of decay resulted in a larger, less erosive and better supply of minerals than burning.

¹⁴ Alvord did not subscribe to the view that shifting cultivation was 'less a device of barbarism than a concession to the character of the soil' (Hailey 1938 in Floyd 1960, 296).

statistics indicating that the prevalent practices resulted in chronic food shortages (Alvord 1929, 11). Despite the fact that these statistics were mere estimates and by no means accurate, they instilled a sense of urgency and objectivity which Alvord later frequently used to wield support for his demonstrator scheme (i.e. Alvord 1930). In typical segregationist terms Alvord (1929, 16) concluded that the African population in the Reserves was 'a liability rather than an asset, but this can change', once they were taught to till their lands better. Demonstrators had to teach plot holders the 'value of kraal manuring and good tillage' during the first two years and a 'system of permanent farming by means of a system of crop rotation' from the third year onwards. Permanent farming would concentrate cultivation on smaller areas and thus set free more land for grazing purposes.^{xxiii} Thus Alvord seemed to be able to succeed where Major Mundy, the Chief Agriculturist and nestor of European agriculture in Rhodesia, had failed after many years of fruitless research: a sustainable land use system based on mixed farming, providing an alternative to the common settler practice of exhaustive maize mono-cropping.¹⁵

One may wonder how successful Alvord's package was in establishing this permanent system of agriculture. The key ingredients of the package, viz., manuring, crop rotation, ploughing and mono-cropping, are reviewed below, together with the response of African farmers, and scholarly critique.

Manuring

Manure was critical to maintain soil fertility and reduce erosion hazards by improving the soil structure and increasing biological activity, setting free plant nutrients for the crop roots. Alvord proposed an application of 10 to 15 tons of kraal manure per acre (approximately 37 tons/ha) once every four years (Alvord 1958, 8; Grant 1976, 252). However, most Reserve cultivators did not have access to the required 12 to 16 heads of cattle per arable hectare to supply that manure (Floyd 1960, 303; McGregor 1991, 92; Page and Page 1991, 10). Realising this, Alvord started a massive campaign for the construction of compost and refuse pits in the 1930s to add to the limited amounts of kraal manure, despite its relatively low fertility value (Floyd 1960, 304). Alvord rejected the use of artificial fertilisers because it would confirm African superstitions of "*muti*" (witchcraft)^{xxiv} and was too expensive. Furthermore Alvord stressed the benefits of intensive cultivation in terms of the increased grazing area it would set free.^{xxv} Later components of the demonstrator programme were specifically directed at improving the quality and size of the grazing area.¹⁶ Floyd (1960, 303-4) has argued that neither of these suggestions provided lasting solutions for the decline in soil fertility: cattle do not add fertility, they merely transfer it from the grazing to the arable block.

¹⁵ During his career (1909-1943) as Chief Agriculturist and later Secretary of the Department of Agriculture, Mundy was responsible for 41 official publications in the Rhodesia Agricultural Journal on various crop experiments and produced the first comprehensive book on agriculture in Rhodesia (Mundy 1928). Thus he 'translated' many farming innovations from other 'pioneer' countries like the USA, Australia and South Africa into locally tested recommendations. Mundy's prime concern was to develop a system of agriculture that could maintain soil fertility levels, reduce erosion hazards and be profitable to the white commercial farmer. Mundy recommended the introduction of a 4-course crop rotation involving (manured) maize, wheat and velvet beans (Mundy and Walters 1919). However, the lack of viable markets for other crops than maize and limited cattle holdings inhibited widespread adoption of crop rotations and manuring. Mundy's ideas made few in-roads in settler agriculture. The establishment of tobacco-maize-grass rotations with heavy applications of fertilisers in the 1950s proved to be the first profitable and sustainable system of European permanent farming on sandvelds in Rhodesia (Grant 1976, 252).

¹⁶ Reference is made in particular to the experiments with improved fodder grasses and the effects of the centralisation programme (curbing and fixing the amount of arable land, thus setting free the grazing land).

Yield responses to manure vary according to soil type and prevailing moisture levels (McGregor 1991, 90; Theisen 1979). In dolerite soils and drier regions manuring does not produce marked yield improvements. In areas where both soil fertility and moisture levels are limiting factors to crop growth, heavy manure applications can aggravate the crop's vulnerability to moisture stress, increasing the risk of crop failure (Grant 1981; McGregor 1991, 90; Nyamudeza 1996, 9; Theisen 1979). Farmers call this effect crop 'burning' or soil 'cooking' (Wilson 1990 in McGregor 1991, 90). Floyd (1960) therefore characterised the Alvord package as a high rainfall package, mainly suitable for infertile, well-leached granite soils. In light of the above African farmers had their reservations regarding the use of manure. The CNC reported in 1920 that Africans did not use manure, because it increased weed infestation, posed great labour demands for 'cleaning' and brought insect pests. Faced with a shortage of kraal manure, even adopting Africans had to resort to alternative sources of fertility, modifying Alvord's package in the process. Theisen (1979) reports extensive application of anthill soil alone or in combination with kraal manure (see also Nyamapfene 1989). McGregor (1991, 92) points at Africans' extensive knowledge of different qualities of leaf litters as fertility inputs. Chikukwa *et al.* (1996) report a mixture of various sources of fertility that are applied by present day communal and resettlement farmers (see also Scoones *et al.* 1996, 113-120). The heterogeneous character of soils within one field (Grant 1981, 170) provided another motive to modify blanket recommendations to suit local conditions, thus spreading risks (McGregor 1991, 91).

Crop rotation

After the initial success of the well-manured demonstration plots at Mt Selinda Mission during the 1922 drought, Alvord was looking for a more permanent system of agriculture that could be systematically promoted by means of demonstration. Many different crop rotation systems were experimented with, until a 4 course crop rotation system was found that could 'rapidly build up the fertility of the soil to a high state of productivity and (...) maintain that productivity indefinitely' (Alvord 1958, 8). The adopted rotation, that became a 'standard' in agricultural extension up to the present day, was as follows: (1) maize with manure; (2) maize or other inter-tilled farinaceous crop; (3) groundnuts, beans or other legume crop; (4) *rapoko* (finger millet) or another close-growing millet crop.¹⁷ These crops followed each other in systematic order on the same land, completing the cycle in four years. In true missionary fashion Alvord laid down his 10 'commandments' for permanent agriculture (Alvord 1958, 8; *cf.* Box 2.1):

1. Thorough stumping and clearing to ensure continuous easy tillage.
2. Winter ploughing to conserve moisture and decompose crop residue.
3. The application of manure once every 4 years to every land in the rotation.
4. A second ploughing just before planting time to aerate the soil.
5. Thorough seedbed preparation to ensure uniform germination of seeds.
6. The planting of maize on the land where manure is applied each year.
7. Proper spacing and planting of all crops, row planted and broadcast.
8. The planting of a legume crop two years after manure is applied to revive nitrogen fixation and maintain a healthy soil by a necessary change of crop.
9. A heavy rooted, close growing crop after the legume, to smoothen all weeds and fill the soil with dense growth of fibrous roots.
10. Crops must not be mixed together in the same land.

¹⁷ In 1934 cotton was included in the rotation after the manured maize crop.

Alvord claimed that through this system 'even the poorest sand veld soil, depleted of most of its fertility, can be brought to a high state of productivity' (Alvord 1928, 1106). However, even during his career as agriculturist, Alvord was challenged as to the permanence and feasibility of this system. At a hearing of the Natural Resources Board, in July 1942, Alvord was criticised by Dr Pole-Evans, a leading expert on agriculture from South Africa. Pole-Evans stressed the need to include a perennial grass crop in the rotation to supply sufficient fodder to the much-needed cattle. Alvord replied that large grazing areas and liberal application of (composted) manure could meet the problem of fertility and avoid the difficult task of teaching the African to grow a crop for fodder purposes only. Dr Pole-Evans was not convinced: 'I am afraid there I can't agree with you.'^{xxvi} Later authors seem to support Pole-Evans, though the issue is still mired in controversy. Grant (1976, 252) points out that only the tobacco-maize-grass rotations practised by settler farmers from 1950s onwards and the African systems of mould or ash culture with shifting cultivation were ecologically sound permanent systems of agriculture on sand veld soils. The African system included a simple rotation of a maize or *rapoko* crop followed by a legume crop and long fallow periods for ecological recovery. However, this system required about 200 hectares per family, which was unfeasible in the face of the Land Apportionment Act. Regarding the Alvord rotation, Grant remarked that it was an intermediate system that ultimately proved unsustainable: 'The rotation did not supply enough nitrogen, insufficient manure was used, results were disappointing, and the system has broken down in most areas.' (Grant 1976, 252).

Scoones *et al.* (1996, 122, 244) in their research on crop rotations practised in Chivi from 1988 to 1991, found that the most common rotation was 'maize-maize-maize.' African preference for maize cultivation was already noted by the Chief Native Commissioner in 1920 and was frequently reported during the 1930s. In 1931, the superintendent for Natives in Fort Victoria accused Alvord of suffering from a 'maize complex': promoting maize cultivation at the expense of *rukweza* (*rapoko*, finger millet), which was in his opinion the main food crop for Africans and should be a compulsory part of any demonstrator's programme.^{xxvii} In his reply Alvord pleaded 'not guilty' and passed the buck onto the Africans:

'It is true, however, that we are very seriously handicapped in our work by the fact that Natives on every Reserve where Demonstrators are working have a very decided "Maize Complex". It is most difficult to persuade plot owners to undertake crop rotation demonstrations and equally difficult to induce them to plant any other crop than maize.'^{xxviii}

Alvord went on to explain that it were the European missionaries, storekeepers and farmers who had encouraged Africans to grow this crop. Farmers bought maize from Africans to feed their livestock and all employers throughout the country rationed maize meal to their African employees for reasons of easy availability, cheap pricing and easy preparation. Africans knew that maize was 'much easier and cheaper to grow than *rapoko*' and that the crop gave better returns to labour (*cf* McCann 2001). And so maize increasingly became the main food crop, whilst *rapoko* was cultivated mainly as a beer crop. In the end Alvord discarded compulsory demonstration of finger millet, since 'continuous cropping of *rukweza* (finger millet, AB) rapidly depletes soil fertility.'^{xxix}

Ploughing

Alvord lamented the African use of hoes to 'scratch the soil.' These 'primitive' implements were seen as indicative of the 'backwardness' of Africans as agriculturists. A staunch supporter of (winter) ploughing, Alvord often described his agricultural mission as the 'gospel of the plough.' The spread of the plough amongst Africans in the Union of South

Africa started in the early nineteenth century (Bundy 1988, 44-46). By the 1870s African plough use had become widespread. Ploughs were bought from European traders and their use was hailed by officials as a sign of African agricultural improvement (Bundy 1988, 71). In Rhodesia African plough use occurred later, the first ploughs being used by African cultivators in the vicinity of Mission stations. Early mission converts at Mount Selinda, who went to work in South Africa, upon their return brought or purchased a plough (Rennie 1973). With the advance of European settlement came the European traders selling ploughs to Africans (Weinmann 1975, 202). From then on the plough spread fast within the Reserves. By 1930 the use of the plough was 'almost general' (Alvord 1930, 6) and by 1940 nearly every Reserve family owned a plough (Scoones *et al.* 1996, 27).

The plough 'stuck' very well with Africans. Its extensive use caused nothing less than a 'revolution' of the prevalent African agricultural system. It facilitated a shift from labour intensive wetland cultivation to labour extensive ploughing of (dry) top lands. As such it improved returns to labour and facilitated agricultural accumulation independent of lineage elders, who possessed most of the wet lands (McGregor 1991, 78; Scoones *et al.* 1996, 27). Despite the fact that this new technology only rose to dominance between 1910 and 1930, it had been associated by Colonial officials with the traditional African shifting tillage system that was condemned severely during the first decades of the twentieth century as destructive tillage (McGregor 1991, 79). As early as 1917 the Chief Native Commissioner noted that large scale African plough cultivation was not accompanied by efforts to improve the productive power of the soil. Official alarm over the destructive effects of extensive ploughing spread during the 1920s. By 1930 Alvord voiced prevalent opinion by referring to the rise of the plough as a 'mixed' blessing. Despite advances in the economy of labour, particularly of female labour,¹⁸ higher yields were attained at hand hoed fields:

'This misguided use of the plough does not improve Native farming, but only increases the acreage of poorly tilled lands.' (Alvord 1930, 6).

The dangers associated with extensive ploughing were increased erosion, more rapid destruction of timber and the ploughing of more land than one was able to cultivate (Alvord 1930, 11).

How was it possible that in such a short space of time African converts to the gospel of the plough turned from progressive heroes into destructive villains? How did this development tie in with the demonstrator programme? To evaluate these questions a closer look is taken at events in Chinamora Reserve at a stone's throw distance from Domboshawa Government school. This Reserve had enjoyed ample attention from demonstrators in training. However in 1929 the school principal and two instructors expressed their disappointment:

'[T]hese men who have received instruction are not attempting to carry out the new methods. Our plot system has resulted in those men having for three years had for sale a much larger surplus crop than ever before, they have become accustomed to a larger income, but this has resulted from the work of the School demonstrators and not really from their own efforts. Now to continue they are breaking up more and more land which they are working almost entirely on the old methods (...) really large acreages are being put under the plough by a few men, (...) timber is being ruthlessly destroyed, and (...) the amount of grazing is diminishing at an appalling rate'^{xxx}

¹⁸ Alvord mentions women in particular, since his gender view postulated that labour of women should be confined to domestic tasks. Earlier on Alvord had condemned hoeing by African women as a kind of slavery.

On the basis of this observation the writers argued for a change of the demonstrator scheme, by setting up small demonstration farms run by demonstrators to serve as community centres, instead of the demonstrator working the fields of plot holders. The CNC in his reply suggested that plot holders in Chinamora Reserve were 'temporarily suffering from an overdose of demonstration' due to the zeal of the pupils to qualify as demonstrators. He also suggested that the lack of sufficient manure combined with a 'get-rich-quick spirit' had led the plot holders in Chinamora to 'fly to the alternative of extensive cultivation'.^{xxx} Alvord, who had suffered a strained relationship with the Domboshawa principal, realised that the moment of truth for his demonstrator scheme had arrived. He set out to defend it with vigour. He stressed that plot holders in Chinamora had never received proper instruction, since the principle of 'learning by doing' had not been applied as on other Reserves. Furthermore 'these six men were progressive natives, with implements and wagons etc. before our demonstration work was started among them'. They had had a ready sale of grain and meal to the store supplying the school. They had never been taught that permanent farming on small areas would set free more grazing land. Instead,

'production, rather than intensified farming, has been given greatest emphasis. These men have been encouraged to form a Farmers association and to become farmers.'^{xxxii}

Alvord rejected the proposed changes to the demonstrator programme, since 'the evils reported from Domboshawa are local only.' However, as the Domboshawa principal had already indicated in his letter, the case was not merely local. Ranger (1985, 61-70) reports on the emergence of 'reserve or plough entrepreneurs': progressive men opening up vast tracts of land to produce maize under plough cultivation. Such is the gist of a complaint from the NC for Ndanga district, in 1944:

'There have been two demonstrators stationed in this Reserve for some years and [they] have made no headway in producing 'Master Farmers'; their followers are still plot-holders, cultivating their one acre under improved methods and a large number of acres under old destructive methods.'^{xxxiii}

These entrepreneurs exploited the communal character of land tenure in Reserves and were able to flourish till such time that most Reserves were centralised.¹⁹ Ranger (1985) suggests that during the world depression and subsequent collapse of the maize price in the early 1930s, agricultural demonstrators assisted these plough entrepreneurs in finding alternative crops, like wheat, to sustain their levels of production. Davis and Döpcke (1987, 73) report for Gutu district that the African reaction to the Maize Control Acts was to increase maize production even further or alternatively switch to wheat, which still fetched good prices. In any case the example set by Domboshawa entrepreneurs was not incidental, but widespread. Even those plot holders who had learned by doing, did not do as learned.

Whereas Alvord attributed the negative (erosive) effects of the plough to its 'misguided use' by Reserve entrepreneurs, the beneficial effects of (winter) ploughing were beyond dispute during the formative stages of the demonstrator programme. Mainwaring (1921) and Alvord (in two of his 'commandments') emphasised benefits like increased moisture retention, decomposition of roots and weeds, aeration of the soil and the facilitation of convenient and timely tillage operations. However, a 'change of thought' started setting in, even before Alvord retired, with the publication of Faulkner's controversial book 'Ploughman's Folly' (Faulkner 1945; see also Allan 1945, and Faulkner 1948). Faulkner (1945, 9) claimed that 'the mouldboard plough (...) is the least satisfactory implement for the preparation of land for the production of crops.' The controversy has deepened over time resulting in two opposed

¹⁹ Under the centralisation scheme, cultivators in the Reserves were allocated equitable land holdings.

camps amongst agricultural researchers and farmers in present day Zimbabwe. The opponents to regular (winter) ploughing claim that mouldboard ploughing is 'not sustainable' (Chuma and Hagmann 1995) and 'the main single culprit causing the loss of soil and water' (Oldrieve 1995). Conventional ploughing allegedly leads to high levels of sheet erosion,²⁰ compaction of the soil below plough depth, burial of protective mulch cover, destruction of organic matter and beneficial micro-organisms through exposure to the sun, and drying out of the soil (Chuma and Hagmann 1995, Norton 1984, Oldrieve 1993, 1995). Instead the practice of zero or minimum tillage, combined with mulching of crop residues and/or ripping, is hailed as the truly sustainable tillage system (Chuma and Hagmann 1995, Lal 1979, 1986, Oldrieve 1993, 1995). The latter comes close to the zero tillage that was practised in the indigenous African agricultural system (Page and Page 1991, 10). On the other hand protagonists of (winter) ploughing have stressed the unfeasibility and negative impacts associated with minimum tillage. Mulch is absent in most communal areas; the water holding capacity of the soil is not increased; the soil is more vulnerable to erosion; there are problems in weed control and it leads to poor crop establishment (see among others Mashavira *et al.* 1995).

Cultivation, weeding and mono-cropping

Alvord had learned at college (in the USA) that high yields could be obtained from one-acre plots by planting single crops in rows with proper spacing and doing cultivation combined with regular weeding. It should come as no surprise that regarding the low yields of Africans, he observed that:

'[o]n the most fertile soils Native crops are much lower than they should be, because of poor tillage, planting in mixtures, too thick planting, lack of cultivation and overcrowding with weeds (...) This results in under-sized, slender plants, which produce small grain heads or none at all (...) the Native fails to see that this practice of over-crowding plants on the soil is just as logical as expecting ten calves to live and grow on the milk of one cow.' (Alvord 1930, 6; see also Alvord 1929).

Alvord experimented extensively to determine proper crop spacing and show the effects of regular cultivation and weeding on school demonstration plots at Mount Selinda and both Government schools.^{xxxiv} Every demonstrator was equipped with a cultivator and supposed to continually go round the demonstration plots to cultivate during the growing season. The objectives of cultivation were the destruction of weeds; setting free of plant food and conservation of soil moisture.^{xxxv}

In 1930 the CNC noted the use of planters and cultivators in three districts and hailed this development as a further step towards adoption of European methods in agriculture. However, this was exceptional. During the rise of the plough entrepreneurs, their lack of weeding was singled out for attack. But again to the Africans extensive planting proved to give higher returns to labour than regular weeding. To add to this, weeding of *striga* (witchweed)²¹ is not very effective. To control *striga* and other weeds Africans burnt prior to planting (McGregor 1991, 81).

Some recent research findings seem to suggest that whilst row planting, mono-cropping and use of cultivators make sense in moderate climates with a highly mechanised agricultural

²⁰ During tillage trials over 5 consecutive years (1989/90 to 1993/94) at Makoholi, soil losses in tons/ha varied from 59.7 for conventional ploughing; 26.2 for hand hoeing and 5.9 for mulch ripping (Chuma & Hagmann 1995, 44).

²¹ The shift from wetland to plough cultivation of dry land was accompanied by a *striga* infestation (McGregor 1991).

sector, mixed or intercropping gives more benefits in semi-arid to arid conditions. Some of the benefits of inter cropping are a greater yield stability; better use of space, light, moisture and nutrients; and less severe pest and disease outbreaks due to the availability of horizontal resistance. Furthermore the intercropping of spreading plants like pumpkin and cowpea smothers weeds and protects the soil against excessive rain and heat (Page and Page 1991, 11).²² It seems Alvord was not completely unaware of such benefits. For instance, in 1929 he suggested the inclusion of a demonstration plot on maize intercropped with cowpea at Domboshawa school.^{xxxvi} However, this suggestion might have fallen prey to standardisation efforts and the exclusive focus of the demonstrator programme on increasing output per unit of land. In present day Zimbabwe various forms of intercropping comprise the dominant farming strategy amongst smallholders in semi-arid areas. Scoones *et al.* (1996, 105-107, 244) report that 75% of all maize is intercropped in Zimbabwe's southern districts.

In conclusion, it can be observed that Alvord's package was highly successful under some conditions only. As demonstrators were eager for success they made sure that demonstration plots were taken good care of resulting in the exceptionally high yields. However, the standardised package did not take into account variations in soil conditions, rainfall patterns and socio-economic position of Reserve farmers. Neither did it provide a sustainable solution to problems of fertility management. Alvord was not blind to these deficiencies. However, with the growth of the demonstrator programme over time, Alvord felt a need to standardise the package at the expense of concessions to suit local conditions. Furthermore, increasing political pressure exerted by both settler farmers and Rhodesian Administrators implied that the initial emphasis on maximising yield returns per unit of land became the corner stone of the programme. The strict enforcement of the Land Apportionment Act over-ruled any consideration of the African strategy to maximise yields per unit of labour. Africans reacted in their own fashion to the opportunities offered. Plough entrepreneurs opened up large tracts of land. Lack of cattle manure led to increased use of alternative sources of fertility. Initially favourable market conditions led to an increase in maize mono-cropping. Yet, climatic vagaries implied a sustained African commitment to inter-cropping.

2.4 ALVORD'S MODERNISATION AND COMMUNITY DEVELOPMENT VISION

Alvord's vision stretched beyond agricultural improvement or the policy imperative of squeezing as many Africans as possible into the Reserves. In his modernisation programme Alvord pursued the missionary ideal of satisfied, self-contained Christian communities with hard-working, rational individuals using agriculture as a base for the accumulation of personal wealth (see also Rennie 1973, 522-527). Alvord incorporated the idea of segregation in his thinking, but not explicitly.²³ He merely romanticised the idea of self-contained village life, as he had experienced himself in his rural home in the United States of America (see Alvord n.d., 1-20). Village industries and local (agri-)businesses would absorb the labour of those people who could not be accommodated in agriculture, for reasons of land shortage or inability. Artisans and skilled workers would provide for the material needs of these communities. Alvord also anticipated the emergence of African leaders and associations that

²² High soil temperatures, caused by row mono-cropping of maize, encourage germination of *striga* (Parker 1984).

²³ An example of his independent thinking on segregation is a proposal to start an African tenant farming scheme on European farm land. During his visit to the USA in 1935, Alvord had observed that black tenants on white land were the most productive of all black farmers. NAZ, S1542/A4/5, Native Tenant Farming. A report on a survey of negro tenant farming in America: with recommendations for Rhodesia. Written by E D Alvord for CNC, 27 January 1936.

could articulate their own wants and desires, serving as an example to other Africans as well as providing services to their communities. These leaders would emerge, not on the basis of royal descent or mastery of the spiritual world, but on merit by developing skills and abilities (Alvord n.d., 1958). Alvord's demonstrator programme embodied a two-level thrust of modernising the household as well as modernising entire Reserves.

Reserve modernisation started with the placement of an agricultural demonstrator in a central location in the Reserve. Once this demonstrator had succeeded in gaining the confidence of a number of 'progressive' farmers and enrolled them as plot holders, he would organise his best producers in a Native Farmers Association (NFA), which would engage itself with the promotion of improved farming practices. Sometimes these NFAs linked up to do collective buying and selling or purchased weighing scales and grinding mills in order to attain better prices. However in most cases their impact was limited and they soon collapsed.

After the agricultural demonstrator had established himself, a community demonstrator would be appointed, to start building 'improved' houses, roads and toilet blocks for the initial plot holders and other respected men (often chiefs).²⁴ The community demonstrator soon became an essential ingredient in Alvord's centralisation policy. The centralisation of Reserves entailed a rudimentary soil classification survey on the basis of which the available land was split in a block of arable land and a block of grazing land, with in between a line of residential stands. By means of centralisation it was hoped to reclaim degraded land and increase the carrying capacity of the Reserve. Whereas initially centralisation was presented as a conservation measure, over the years it became a measure to facilitate administrative control (i.e. ease the collection of hut taxes). Centralisation itself did nothing to stop degradation. Rather, it aggravated erosion through concentration of people and cattle movements (McGregor 1991). Only when it was followed by limitation of arable acreages, grazing improvement schemes (paddocking) and registration of arable land holdings to facilitate construction of contour ridges could it produce any beneficial effects in terms of increasing the carrying capacity and combating sheet erosion. The biggest benefit to government was the consolidation of households and their farming operations, which was essential for the implementation of the Land Husbandry Act in the 1950s (McGregor 1991, 1995). For the local traditional leadership and those aspiring to become part of that leadership, centralisation offered opportunities to establish, expand or fix areas of control. Andersson (1999) suggests a lot of new villages under newly recognised kraalheads were established during centralisation.

If there was a mission post close to or in the Reserve, a home demonstrator, also known as "Jeanes teacher", followed suit.²⁵ These would be recruited from the ranks of devout female mission students or else from respected house wives. After a short training at Domboshawa school, they would concentrate on health issues, nursing and household duties in European fashion. Later so-called village homecraft schools were introduced to instil 'habits of discipline and cleanliness' amongst African women and their children. These efforts were directed at 'promoting civilised methods and habits amongst the rising generation.'^{xxxvii}

²⁴ The work of community demonstrators was to lay out 'model rural villages' during or after a centralisation survey had been done. 'All pole and mud huts were to be abolished and substituted with larger, well-ventilated circular huts or houses in Kimberly brick and burned brick.' (Alvord 1958, 25) Pole and mud huts were considered a health hazard.

²⁵ The first home demonstrator was appointed in 1931. By 1935 there were 25 home demonstrators operating from Mission stations.

Box 2.2: Some leading Reserves in the early days of the demonstrator programme

- **Chinamora Reserve** (end of 1920s). Chinamora was exposed to a large number of demonstrator trainees and the first to have a Native Farmers Association (NFA). Certain wealthy individuals capitalised on the demonstrators, using them as 'farm managers' to produce increased cash income. By 1929 the 'improvement' drive of the demonstrators had been transformed into an accumulation drive by a few leading cultivators, who expanded acreages and marketed their produce through a business consortium (NFA). In 1933 the government tried to curb this undesirable development by enforcing centralisation (and concurrent land re-distribution). Up to the present day Domboshawa area hosts a relatively wealthy peasant class that capitalises on its proximity to the Harare market, focusing on horticultural production and private marketing (hawking).

- **Selukwe Reserve** (end of 1920s, beginning 1930s). Selukwe was Alvord's leading example of modernisation that turned out to be a paper reality after the visit in 1942 of the NRB (see below). It was the first Reserve to be centralised (1928-1930) with help of some opportunistic headmen and the use of persuasive force (McGregor, 1991). The first community demonstrator was stationed in Selukwe in 1932. In many respects Selukwe provided a testing ground for Alvord in the early days of the programme. McGregor (1991) describes how the programme produced differential impacts in spatial and social terms.

- **Zimunya and Mutambara Reserves** (early 1930s). These reserves had already witnessed a boom in agricultural production facilitated by the early establishment of irrigation furrows. When Alvord came in with his programme to re-direct this intensification drive according to the modalities of the demonstrator programme, he and his demonstrators met stiff resistance, which proved lasting. Alvord's experiment with Zimunya furrow as an officially recognised community irrigation scheme resulted in a folly (see Chapter 4, and Van der Zaag and Röling 1996). In Mutambara the Chief and his relatively wealthy followers did not accept government interference (Manzungu, 1995). The resistance in both areas went beyond mere resistance to centralisation. Both schemes in the end proved technical nightmares and examples of the antagonistic effects produced by a *tabula rasa* intervention approach by the government (Manzungu 1995, Roder 1965).

- **Zimutu Reserve** (1930s). Despite a difficult start in Zimutu, which saw the first demonstrator clashing with vested interests of certain native messengers organised in the Southern Rhodesia Native Association,^{xxxviii} Zimutu became Alvord's shining example in the late 1930s. Alvord himself faced some stiff opposition in Victoria (Masvingo) both from white settler farmers, who disliked his support for African production and the resulting competition, and from the superintendent for Natives, who accused Alvord of suffering from a maize complex (see above). However, a successful switch to wheat production saved the programme and culminated in the so-called 'voluntary de-stocking' exercise in the mid-1930s.^{xxxix} Zimutu was centralised in 1933 and was the venue of pasture improvement experiments in the late 1930s. In the late 1960s and 1970s Victoria Province and Zimutu in particular became examples of successful agricultural extension by means of the Master Farmer Associations (see 2.6).

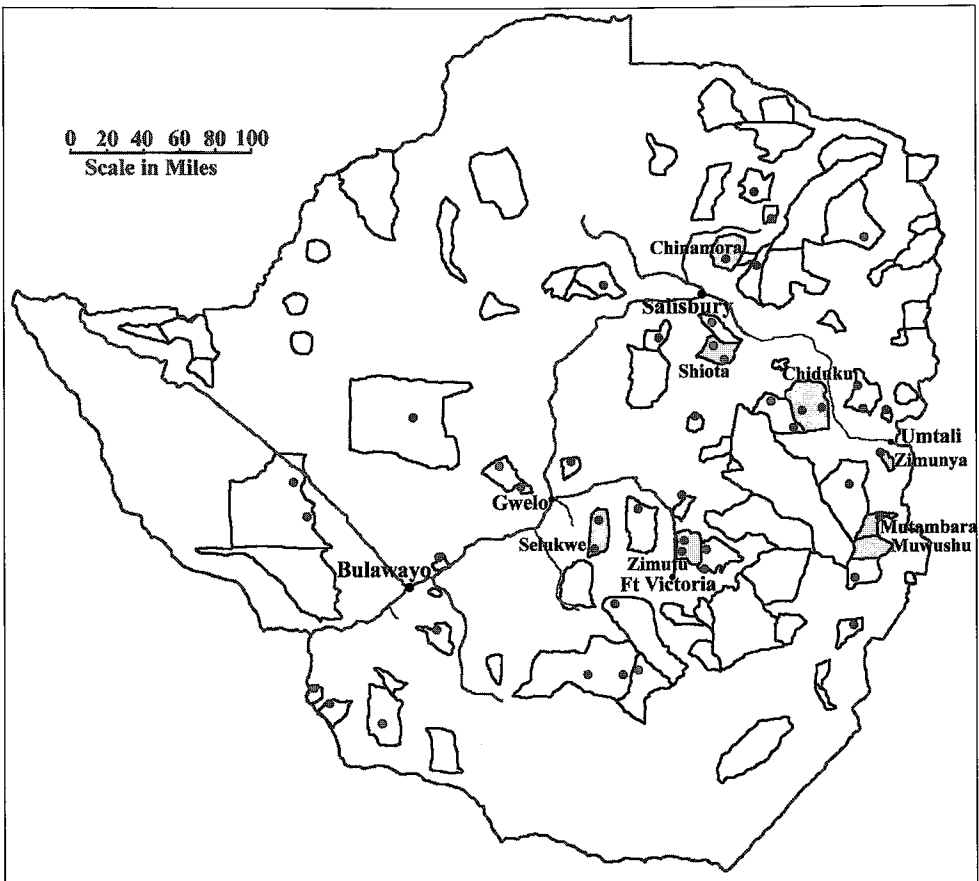
- **Chiduku Reserve** (1942). Mainly through the industrious efforts of an authoritarian Native Commissioner, Chiduku Reserve witnessed the start of a more compulsory and systematic conservation drive using forced labour. It became an inspiring example for the Natural Resources Board on tour and set the future *modus operandi* of the Native Land Husbandry Act. Events in Chiduku marked the pass of the initiative in rural state intervention from Alvord to paternalistic, coercive Native Commissioners and NRB technocrats.

- **Shiota Reserve** (late 1930s and 1940s). Shiota was included in the demonstrator programme from the start, moving through its various stages (agricultural demonstrator, NFA, community demonstrator, and home demonstrators from Waddilove mission). Monumental was the start of the Master Farmer programme (see Box 2.3). The Master Farmers organised themselves in the Shiota Leaders Association, which organised an annual agricultural show and hosted field days.^{xl} The tedious and thorough re-implementation of centralisation in 1943 facilitated strict control by the Land Development Officer, preceding the implementation of the Native Land Husbandry Act.^{xli}

- **Nyanyadzi irrigation scheme, Muwushu Reserve** (1940s onwards). This scheme became the pride of Alvord and a national example for accelerated agricultural modernisation (see chapter 4).

After the establishment of an agricultural, community and home demonstrator, and implementation of centralisation, attention could divert to other areas of improvement depending on the type of demonstrator (soil erosion, forestry, livestock) that was deployed next. The latter often depended on the interest of the resident Native Commissioner (see box 2.2 and map 2.1 for some leading Reserves). In some Reserves attention was paid to the establishment of wood lots, in others to tackling the plight of livestock by means of pasture improvement experiments and/or 'voluntary de-stocking'. Elsewhere a start was made with the construction of contours ridges and storm drains.²⁶ By 1948 there were 163 agricultural, 86 community, 25 erosion control, 34 forestry and 20 livestock demonstrators operating in the Reserves under the guidance of 46 African supervisors and 50 (white) Land Development Officers (LDO).^{xiii}

Map 2.1: Reserves and demonstration centres in 1933



Note: Reserves mentioned in box 2.2 are highlighted. Dots indicate the place of an agricultural demonstrator by the year 1933. Also indicated on the map are Reserves without a demonstrator (no dot). These formed the majority in 1933.

Source: Based on map produced by Alvord, Annual report of the Agriculturist for Natives, 1933.

²⁶ After 1938 it became compulsory to construct contour ridges and storm drains on centralised Reserves.

Box 2.3: The story of Mr Vambe, the first Master Farmer^{xliii}

Alvord in his autobiography relates the story of Mr Vambe Mutombgera, one of the first plot holders in Shiota Reserve. The first agricultural demonstrator in Shiota had been deployed in 1928 at the invitation of a small group of men. However the demonstrator faced considerable resistance and 'even open hostility' from the majority of Reserve dwellers, to the extent that 'he had to be guarded by his plot holders when visiting some parts of the Reserve.' Despite this initial set-back Shiota witnessed the start of the Master Farmer programme, which still formed the mainstay of the extension service, Agritex, in the mid-1990s.

'Back of this movement is the story of Vambe, a poor man, dressed in ragged clothes and living in primitive pole and mud huts. His one wife was dressed in a goat skin drape, naked from the waist up, and his children ran around in their birthday suits. He was tilling a total of 32 acres of worn out, almost pure sand. But, his cattle kraals were belly deep in well rotted manure. In 1929, he harvested more bushels from his one acre demonstration plot than from his other 31 acres combined. He immediately realised what a fool he was to waste his time, labour and seed in ineffective farming methods' (Alvord n.d., 39). However, his wife suspected witchcraft and prohibited her children to eat the maize thus grown, until Vambe himself and the demonstrator had eaten first and emerged healthy from the experience. 'I (Alvord, AB) persuaded him to add 3 more acres and plant the 4 acres to a systematic 4 course crop rotation, with outstanding results. In 1932, the crops in this demonstration were so outstanding that news of it spread for a hundred miles in all directions. Native farmers travelled by foot and bicycles from distant Reserves to see it for themselves. That year, at the 'before harvest' meeting, he told the assembled 2,300 Natives that never again would he scratch the soil "like a baboon looking for worms". He increased his rotation to more than double the area, abandoned all primitive methods of tillage and put his entire land under the systematic crop rotation. He also made his two wives limit their labours to proper crop rotations on 2 acres each. By 1934, we decided to officially honour him as a "Master Farmer", and, at the following before harvest meeting, which was held alongside Vambe's land, he was promoted with a certificate as a "Master Farmer". Thus began the scheme for "Master Farmer Awards" to which, later, an ornate badge was added to a printed certificate. Today, Vambe is a progressive and prosperous farmer; and an outstanding leader of his people, who he dresses as well as any white man' (Alvord n.d., 39) The Land Development Officer for Marandellas added in 1947 that Vambe had made so much money in the process 'that he was able to purchase four wives.' Later still Vambe bought a 230 acres Native Purchase farm for his son (Alvord 1958, 26).

Alvord hoped to produce African leaders from this new 'class' of Master Farmers. They were to lead the way for other improving cultivators. In 1937 the small group of recognised Master Farmers formed the Shiota Leaders Association, that set out to organise the annual agricultural show from then onwards. The association together with local agricultural staff even built a show hall for this purpose. Prizes were given to the best performers in agriculture, livestock, grinding and men's handwork either by Alvord himself or other high-ranking officials. If Master Farmers were found to be practising agriculture in another way than stipulated, their badges and certificates were withdrawn.²⁷

Household modernisation was defined by an evolutionary process of 'improved' farming. First one became a *co-operator*: a person who is copying some components of the crop improvement package. In later stages of the programme co-operators were identified by means of estimated average crop yields.²⁸ The co-operators did not form a group, rather they

²⁷ In February 1945 the certificates and badges of six Shiota Master Farmers were withdrawn by the Land Development Officer for reasons of not winter ploughing, not sticking to proper crop rotations, and growing maize on unstumped land 'under native methods'.

²⁸ In the late 1940s the average yield for co-operators hovered around 6 bags per acre (1.4 ton/ha); for Master Farmers around 8 bags per acre (1.8 ton/ha) and for plot holders around 10 bags per acre (2.3 ton/ha). NAZ, SRG3, Annual reports of the Director of Native Agriculture, 1947-1949. Mind that demonstrators had an interest in well performing plot holders, a fact which may have resulted in inflated yield estimates for plot holders.

formed a category of starters who were distinguished by demonstrators on the basis of their agricultural performance. They provided a reservoir of future *plot holder* candidates,^{xliv} the next stage in the process of modernisation. Demonstrators carefully monitored plot holders' activities. Before harvest meetings were held at the fields of successful plot holders. Demonstrators were evaluated on the basis of the performance of these plot holders. Consequently demonstrators carefully selected plot holders and pushed them on. Since the improved practices required a lot of resources (oxen, plough, and access to markets), mostly well-endowed Reserve farmers were selected as plot holders. When one would not own two oxen for instance, one could never dream of qualifying to become a Master Farmer.^{xlv}

After showing consistent determination in practising improved agricultural methods, one could qualify as a *Master Farmer* (see box 2.3). In order to qualify, one was required to build a square, permanent house, farm sheds and possess oxen.²⁹ Thus only relatively wealthy cultivators managed to attain this highly regarded 'status'. The limited opportunities within the Reserves to improve one's living standard made established Master Farmers look beyond the Reserves to satisfy their aspirations (see 3.1).

The above model only applied to the male head of the household. For women, the modernisation effort implied a move away from agricultural activities to the confines of domestic duties. Home demonstrators played a crucial role in providing women of upwardly mobile Reserve cultivators with an example of a domesticated career. Processing of farm products, sanitary duties and house keeping became the mainstay of these women, though some became nurses or moral crusaders for the church. Their direct agricultural involvement was supposed to be confined to gardening near the homestead.^{xlvi}

The ideals of the caring mother and the hard working father fused in the model of the *Christian nuclear family*. Children were supposed to go to school and on Sundays the whole family would attend a church service.^{xlvii} To cater for the necessary cash for schooling, clothing and building of a permanent house and farm structures, part of the crop proceeds had to be sold. These Christian ideals had serious practical implications for agricultural intervention programmes. Hardly any women qualified as Master Farmers, the only exceptions being widows. Similarly land registration and access to irrigation plots was limited to the male head of household or the single widow.^{xlviii}

2.5 COMPULSION AND CONTROL

The demonstrator programme received a considerable blow during the Great Depression of the early 1930s. The world recession saw prices for agricultural products plummet.³⁰ These gloomy events made the fears for African competition more pronounced amongst European settler farmers. In 1931, they directed their anger towards Alvord and his efforts to increase African maize production: 'many remarked that Alvord ought to be hung.' Whenever Alvord was seen in Fort Victoria 'he was shunned and treated as a pariah.' (Alvord 1958, 20). Some Native Commissioners and Superintendents used the opportunity to express their discontent

²⁹ A retired demonstrator remarked on the issue of master farmers and livestock: 'If you can't get sufficient manure on your acres, it is very, very difficult to qualify as Master Farmer. Yeah, he (the plot holder, AB) is handicapped by not having enough manure.' Interview with E Chikazhe, Mount Darwin, 28 June 1997.

³⁰ In 1930, the export maize price dropped from 10 shillings to 8 shillings per bag and in 1931 it slumped even further down to 4 shillings per bag, whereas production costs averaged 8 shillings per bag. Cattle exports slumped to nil during the 1931-2 outbreak of foot-and-mouth disease (Phimister 1988, 172).

with the programme. The assistant Native Commissioner for Goromonzi lamented the fact that demonstrators imbued Africans with a 'get rich quickly' attitude:

*'whereas the goal should be the raising of the level of agriculture throughout the Reserves, (...) I see a marked tendency for the demonstrators to become, in effect, the farm managers of the few enterprising and money seeking plot owners and it is a tendency that should be checked.'*³¹

The CNC yielded to these pressures from European farmers and members of his own staff by ruling that 'the saturation point had been reached with regard to the number of agricultural demonstrators and ordered that demonstrator training at Domboshawa should be discontinued' (Alvord 1958, 27).³¹ The result was that from 1935 to 1939 the number of agricultural demonstrators only increased by six, which had been the annual rate of increase before 1935. In order to save the white farming sector from imminent bankruptcy, the government of Rhodesia introduced the Maize Control Acts (1930, 1934) and Cattle Levy Acts (1931, 1934). By means of these Acts African cattle owners and maize growers were forced to subsidise white ranchers and farmers.³²

The reaction of African farmers was to withdraw from the demonstrator programme. Many plot holders complained bitterly: 'What is the use of adopting better methods and producing more crops when there is no market?' (Alvord, 1958, 26). Alvord protested strongly against the Maize Control Act in his annual report for 1933 and pointed out the dangers to the country as a whole, if Africans were denied opportunities to sell excess grain for cash.³³ Alvord feared not only that his demonstrator programme would come to a halt, but also that his ideals of self-supporting rural communities would have to be shelved. In an attempt to ensure African plot holders a certain cash income, Alvord paid increasing attention to the promotion of alternative (cash) crops like wheat and cotton as well as possibilities for establishing co-operative marketing ventures amongst Africans. However, these efforts only produced tangible results in some well watered Reserves (wheat) and in African irrigation schemes in the 1940s (see chapter 4). Cotton growing experiments started in 1934, and despite initial setbacks, gradual expansion took place. By 1950 cotton was one of the biggest money spinners in Mhondoro Reserve (Alvord, 1958, 27).

The rise of conservationism

After 1935 conservationist concerns started to take prevalence over agricultural production issues in the Reserves. As a consequence of erosion alarms raised in the USA (Dust Bowl) and South Africa in the 1930s (see Anderson 1984, Beinart 1984, Beinart and Coates 1995, Drinkwater 1989, McGregor 1995), Alvord and Native Affairs officials became increasingly concerned with over-population, over-stocking and the imminent erosion menace in the

³¹ After protests by Alvord, the CNC allowed the training to continue at a rate commensurate with annual loss of staff.

³² Under the Maize Control Acts, African producers were paid between 1s.6d. to 6s.6d. per bag from 1934-39, whilst white growers received an average price of over 8s. per bag. The Cattle Levy Acts imposed a 2s.6d. levy on slaughter of cattle for domestic consumption in order to pay a bounty for white cattle exports. In 1934 an additional 3d. tax per head on all cattle was imposed (Phimister 1988, 184).

³³ In his annual report for 1933 Alvord recounted that 'on many reserves this year natives were not able to sell grain for cash and had difficulty in paying tax and dipping fees. This imposes upon them a hand-to-mouth existence under which they cannot progress. With no income they are low consumers to the detriment of the country as a whole. If they could sell a part of their excess grain for cash their capacity as consumers would be greatly increased and the whole country would benefit. It is simply a question of sound economics. If reserve natives are not assisted in the development of self-supporting rural communities it will be ruinous to the future interests of Rhodesia.'

Reserves.³⁴ Alvord himself fuelled these fears by providing comprehensive figures on the situation in the Reserves after his first visit to the USA in 1930 (see Alvord 1930). During a second visit to the USA in 1935, Alvord undertook a study of the soil conservation work done amongst Blacks. Upon his return he reported to the CNC that some Native Reserves were as badly eroded as some of the worst areas in the United States. He estimated that 1.5 million acres in the Reserves (16% of all arable land) had been badly damaged by sheet and gully erosion (Alvord 1958, 29). Faced with such alarmist figures the CNC once more felt compelled to render support to Alvord and his programme. In 1936, the first Soil Conservation Officer was appointed,ⁱ assisted by 3 soil erosion demonstrators. This officer set out to construct contour ridges in recently centralised Reserves with the help of paid labour gangs.ⁱⁱ In addition all agricultural demonstrators were trained in soil conservation and pegging in 1936, returning to their Reserves with ox-drawn terracers.ⁱⁱⁱ

Centralisation became the main thrust of Alvord's programme. It became conditional that a Reserve was centralised before the services of a demonstrator would be rendered to it.ⁱⁱⁱⁱ However, soil survey work preceding actual centralisation and the allocation of individual land holdings proved tedious and time-consuming, even though the number of Land Inspectors under Alvord's command was increased from two to four in 1938. Meanwhile requests from Native Commissioners to centralise Reserves kept on pouring in, convinced as they were that centralisation was the only remedy left to save the Reserves.^{lv} A request for centralisation of Sabi reserve in 1938 received a gloomy reply from Alvord: 'With our present limited staff it is possible that we might be able to do Sabi reserve in 12 to 15 years from now.'^{lv} But it was not only a lack of staff that threw spanners in the centralisation drive. The NRB on tour in 1942 discovered that, despite Alvord's frequent reports of the successful rehabilitation of Selukwe Reserve,³⁵ the reality of centralisation was devastating:

'The Selukwe Reserve was held up as an example of how a degenerated area had been rehabilitated and it is very disappointing to us now to find that it has reverted to desert conditions practically.'^{lvi}

The NRB found that the compulsory ridge construction scheme in Chiduku reserve under the authoritarian leadership of the local Native Commissioner offered more hope for a quick remedy.^{lvii} The Natural Resources Act of 1941 placed the initiative of state intervention in Reserves firmly in the hands of Native Commissioners. Alvord succumbed to the increasing call for 'compulsion and control' in the quest for soil salvation in the Reserves, and concluded that: 'As far as its effect on the general Native is concerned we have wasted our time for 17 years in conducting agricultural demonstrator work in Native Reserves.'^{lviii} Alvord called for a unified Department to implement de-stocking, compulsory crop rotation and control over tillage methods. The Native Production and Trade Commission of 1944 (Godlonton 1944) effectively sealed the fate of the Africans in Reserves and processes of

³⁴ Initial fears of degradation were raised in South Africa during the 18th century and focused on destructive agricultural practices employed by settler farmers. It was feared that ultimately settler farmers were going to ruin all productive land and thus leave no hope of a sustained colonial presence. During the 1920s and 1930s attention increasingly shifted to the destructive effects of African agricultural practices. The erosive effects of the squeeze of many Africans in marginal Reserve, became manifest and served as an excuse for comprehensive, coercive state intervention in the lives and means of these Reserve Africans (Beinart 1984).

³⁵ Alvord recounted in his annual report for 1933 that 'on Selukwe reserve, where centralisation was first carried out cattle are in much better condition, land under cultivation has been reduced by half and crop yields are larger than before centralisation, grazing areas are growing up to good timber and considerable erosion has been checked.'

voluntary change by suggesting imposition of good husbandry conditions in Reserves.³⁶ Despite the fact that Alvord became the first director of the Department of Native Agriculture in 1944 and commanded considerably more staff in his final years before retiring in 1950, he had lost the initiative of African modernisation. He was forced to concentrate his improvement efforts on limited areas and did so increasingly on irrigation schemes, which offered the biggest potential for fast modernisation.

By the time of his retirement Alvord had become thoroughly frustrated in his efforts to demonstrate ways to raise agricultural productivity and conserve the soil:

'We are faced with a stubborn, childish, conservative mass of people who are resistant to change (...) During the past 20 years, millions of acres of once good, arable lands have been ill-treated and mismanaged under improper tillage methods, in spite of the fact that for 20 years we have conducted demonstration plots throughout the country which have shown to large masses of people the results of good tillage methods. But their eyes are shut and their ears are tight.' (Alvord 1948, 18).

2.6 THE MODEL OF MODERNISATION AFTER ALVORD: AGRICOLAS VERSUS ADMINISTRATORS

With Alvord out of the picture, a tug of war ensued over his heritage between two rival groups within the Southern Rhodesian administration, both operating within the conservationist mould. In short, the struggle was over modernist development versus traditionalist containment of Africans in their Reserves. On one end of the spectrum the technical bureaucracy, Alvord helped to create and guide into a formidable outfit, wanted to enforce the modernisation model at a massive scale through the implementation of the Native Land Husbandry Act (NLHA). When this operation floundered on the shores of African nationalist opposition, the Administrators, situated at the other end of the spectrum, took over, promoting the ideal of a firmly segregated society, where Africans were to develop their own communities under the guidance of traditional leaders controlled by the settler state. In between the reigns of these two opposing camps was a brief period of reflection (1961-64), which was used to develop group extension approaches to counter individualistic tendencies inculcated in Alvord's model for modernisation. First a brief recap of the diverging ideals with regard to African development is provided.

Missionary, settler and colonial administrator's ideals with regard to African development

Alvord coined his development vision during his days as agricultural missionary at the Methodist mission station in Mount Selinda. Methodist missionaries wanted to 'liberate' the African individual from his web of superstitions. This could be done by instilling five so-called essential Christian attributes in African converts: scientific rationality; a sense of dignity of labour promoting individualism and entrepreneurial skills; development of self-supporting Christian communities; adoption of western domestic and personal life styles; and intelligent literacy in the bible (Rennie 1973, 302-309). Missionaries tried to achieve their goals by means of education and efforts directed at improving other aspects of the daily life of Africans. Their external policies were to a certain extent 'colour blind' in the sense that formally speaking they did not object to Africans attaining positions in society that in

³⁶ The Commission first of all thought of compulsory planned production. However, in view of the anticipated protest of European farmers against such measures it was decided to resort to good husbandry practices, applied to both African and European producers. 'If that be not practicable, they should nevertheless be imposed on the Natives.' The recommendations of the Commission led to the enactment of the Good Husbandry Act of 1948, a precursor to the Native Land Husbandry Act of 1951.

colonial Rhodesia were reserved for whites only. Thus feeble support was given to early cries for free hold land by African converts (Palmer 1977b, Rennie 1973).

Native Affairs officials and white settler farmers provided an alternative to this ideal by promoting the emergence of a segregated society that was however not completely without inter-relations.³⁷ Education for Africans only had to be provided up to the extent of enabling the white industry and mines to get access to cheap, sufficiently qualified labour. Education that led to an environment of competition with the white labour force was desisted. Accumulation of wealth by African individuals on the basis of skills or concentration of resources was seen as a potential danger to the policy of segregation (see 2.1). Initial support for Alvord's demonstrator programme was mainly based on the premise that his improvement policy would allow for more Africans to be squeezed into the Reserves. Fears of African farming competition during the world depression of the early 1930s combined with conservationist alarms on the destructive effects of over-population and over-stocking in the Reserves broke this coalition of convenience between Alvord, settler farmers and the Rhodesian administration.

Table 2.1: Changes in Department and home Ministry responsible for African extension

Year	Department	Ministry
1926	Agriculturist for Natives in Department of Agriculture	Secretary for Lands and Agriculture
1927-30	Agriculturist for Natives in Department of Native Education	Ministry of Education
1930-33	Agriculturist for Natives in Department of Native Development	Ministry of Native Affairs
1933-44	Agriculturist for Natives in Native Affairs Department	Ministry of Native Affairs
1944-61	Department of Native Agriculture	Ministry of Native Affairs
1962-63	Department of Native Agriculture	Ministry of Agriculture
1963-68	Department of Conservation and Extension (CONEX)	Ministry of Agriculture
1969-78	Department of Tribal Agriculture	Ministry of Internal Affairs
1978-81	Department of Agricultural Development (DEVAG)	Ministry of Lands, Resettlement and Rural Development
1981-2001	Department of Agricultural, technical and Extension services (Agritex)	Ministry of Lands, Resettlement and Rural Development

Source: Reid (1978) and NAZ records

Within the resulting conservationist policy mould two alternative African development visions emerged inside Southern Rhodesia's bureaucracy, pitting Administrators against Agricolos (*cf* Chambers 1969). The Administrators, represented by Native Commissioners and their successors at the Ministry of Internal Affairs, favoured strict control over African development exerted by traditional leaders, hoping to preserve as much as possible of the social and moral fabric of African traditional society. African aspirations thus were to be limited to a bare minimum, except for two groups. The traditional leadership itself, which had to be confirmed in its authority, was allowed certain political and agricultural privileges contained in the Community Development policy (Aquina 1963, Holleman 1969, Weinrich 1971). In addition a

³⁷ In the 1930s Rhodesia's Prime Minister Huggins advocated a 'complete social, political and geographical segregation' along the lines of a twin pyramid. Chief Native Commissioner Carbutt even suggested to move all advanced Africans north of the Zambezi. However during the world depression of the early 1930s, Huggins realised that it was impossible to run Rhodesia's economy in complete segregation. The African was required as a 'shock absorber in the state motor car.' African cattle owners and maize growers were forced to subsidize white ranchers and farmers by means of levy and control Acts (Phimister 1988, 183-96).

small group of loyal African soldiers, civil servants and master farmers was sparsely allowed to undertake modern freehold farming in Native Purchase Areas^{lix} (Cheater 1984, Palmer 1977b, Shutt 1995).

In contrast, the conservationist Agricolos, represented by the agricultural bureaucracy Alvord helped to put up, hoped to develop African society through the modernisation of agriculture in the Reserves along the lines of the master farmer model, whilst transforming excess Reserve population into a skilled urban labour force. Whilst not shying away from forceful implementation of this ideal, as demonstrated during the NLHA days, the Agricolos thus hoped to break the power base of African traditional leaders and substitute them with Alvord's modern Christian men represented in agricultural associations and Native councils. One focus of the continuing struggle between Administrators and Agricolos was the home ministry of the department responsible for agricultural extension in the Reserves. The department changed hands 11 times before its post-independence successor (Agritex) took over (see table 2.1)

NLHA: state backed modernisation and rural protest

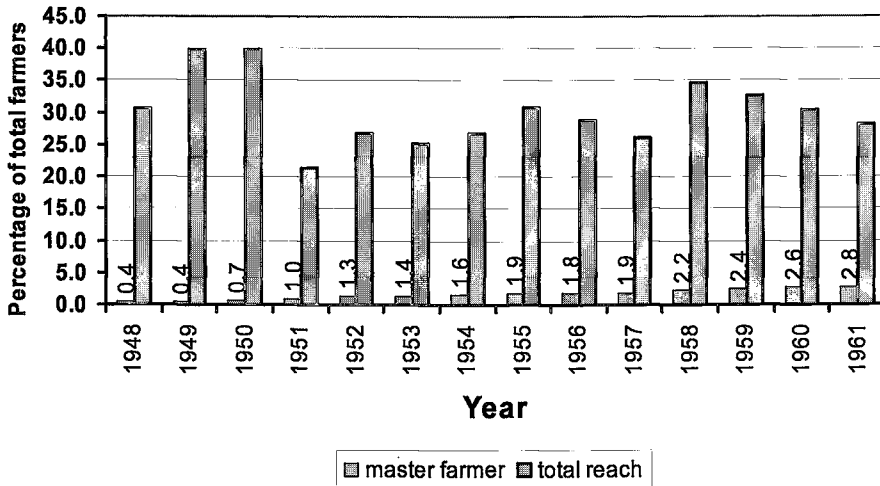
The Native Land Husbandry Act and its forceful implementation can be seen as a massive attempt by the expanding technical bureaucracy to enforce Alvord's modernisation model, thus halting the environmental degradation of over-populated and over-stocked Reserves and putting African agriculture on an environmentally, economically, and agronomically sound footing. The NLHA put the agricultural technocrats in the driving seat, propagating a modern ethic of radical restructuring of urban and rural African society, whilst the conservative administrators with their ideas about traditional rule and tribal structure took a back seat. Unlike previous policies, the NLHA did not intend to squeeze more people into the Reserves, but 'to put a stop to labour migration between Reserves and urban areas, and to halt further settlement in the reserves, by issuing saleable land and stock rights to a permanently limited number of African farmers' (Alexander 1993, 24). Thus it promoted individual land rights, the market and a secular state (consisting of technical officers monitoring land use and land transfers), at the expense of lineage-based land rights and tribal governance. Those excluded from the Reserves would provide a stable work force for the booming industrial and white agricultural sectors. Implementation started in 1951 and was accelerated in 1955, diverting more and more personnel away from productive extension activities (Kennan 1980).

The result was a steady decline in the number of African cultivators reached by extension (i.e. master farmers, plot holders, co-operators, and followers). By the time the implementation of the NLHA grinded to a halt in 1961, master farmers constituted a meagre 2.8% of all African cultivators (see graph 2.1). Rural African nationalist protests across the country in 1960-61 forced the government to reconsider its technocratic policies encapsulated in the NLHA (Drinkwater 1989). Agricultural officers, demonstrators and master farmers became the object of personal attacks, petrol bombing and other forms of mayhem, since they acted as virtual policemen (or government stooges) prosecuting Africans for agricultural crimes.

Where did it go wrong? A good part of Zimbabwean historiography is devoted to this question. Fact is that there was insufficient land to implement the NLHA to the letter, that its accelerated implementation led to planning mistakes, and that the calculations underpinning the NLHA farming model were flawed (Floyd 1959, 1960). Moreover the formal employment sector could not absorb those excluded from the land, and Africans fiercely resented the coercive destocking and conservation measures. Thus the NLHA created a large and diverse constituency for the African Nationalist cause. Whilst some authors emphasise

the role of the landless Africans in spearheading nationalist resistance, others (Phimister 1993, Ranger 1985) argue it was the reserve entrepreneurs who wanted to safeguard their disproportionate hold over land and cattle, that were behind the protest. In any case the massive protest led to an extensive review of government policies and administration in rural areas, by four government appointed commissions.³⁸

Graph 2.1: Proportion of master farmers and farmers reached by extension, 1948-61



Re-appreciation of the human factor in African development: community development

The context of the commissions was one of panic over African opposition, negotiation of a new constitution with Britain and moves towards majority rule in the Federation of Rhodesia and Nyasaland. The main outcomes of the commissions were the creation of a new Ministry of Internal Affairs (with District and Provincial Commissioners replacing NCs and PNCs); the creation of a separate Ministry of African Agriculture (not resorting under Internal Affairs); and the placement of the overall co-ordination, including the Community Development Policy, under the Ministry of Internal Affairs. Thus the overall control over rural development was reverted back to Administrators (Alexander 1993, 74).

In the final analysis, rural resistance to the NLHA was explained in terms of a lack of appreciation by technocrats of the 'human factor'. The general perception was that the social fabric of African tribal society had broken down and needed to be restored. African spiritual ties to land and cattle were considered impervious to logical or other argument. So whilst nothing was wrong with the technical rationale of the Act, it had been bound to fail and create resistance due to Africans' engrained irrationality. It was believed that chiefs as the natural custodians of the land could deliver the much needed administrative control and community cohesion necessary for a new policy of community development, adopted in 1962. This latter policy had been advertised by James Green, an American consultant hired by the Rhodesian Government (Green 1963). Community development as first applied in India in 1952,

³⁸ The Mangwende Commission reported on the unrest and break-down of local government in Mangwende Reserve; The Robinson Commission on administrative and judicial functions of the Department of Native Affairs; the Paterson Commission on the (re)organisation of public services; and the Phillips Commission on economic development and African agriculture.

provided an alternative approach to paternalistic forms of central government planning and the anomalies it produced. It espoused the principles of voluntary, integrated forms of self-help and bottom-up processes of objective setting by communities themselves. It was meant to address the real needs of the population, give priority to the human dimension of development over the pursuit of technical targets, and resolve the problematic position of government officials enforcing unpopular measures whilst purporting to be friendly advisors to the African population (Mutizwa-Mangiza 1985, 25).

This emphasis on the community as entry point and homogeneous entity for the spread of development initiatives tied in with new ideas on the process of agricultural extension. During the first regional workshop on extension methods, hosted by the Southern African Regional Committee for the Conservation and Utilisation of the Soil (SARCCUS), the conservationist top of regional Agricolos was exposed to nascent diffusionist ideas developed by Everett Rogers and his team in the USA (Vincent 1962). The existing agricultural landscape in the Reserves, consisting of ordinary farmers, followers, plot holders and master farmers, now had to be reconceived in terms of communities consisting of innovators, early adopters, informal leaders, laggards and stubborn, illiterate non-adopters. Whole communities could be uplifted by making instrumental use of the process of diffusion of innovations (Rogers 1962). Informal leaders and innovators had to be enticed to adopt new technologies, taking other adopter groups in their wake. Suddenly master farmers had become 'social nonentities': individually excellent leaders but unreliable for the purpose of diffusing innovations (Kok 1962, 69). Field days, previously used to demonstrate and celebrate the success of the master farmer model, were now to be used as a 'medium of diffusion, creating awareness and interest and, in some cases, enabling the farmer to evaluate certain practices' (Ibid., 72).

Under the new administrative dispensation agricultural extension efforts in communal, purchase and commercial farming areas were united in the Federally constituted Department of Conservation and Extension (CONEX), resorting under the Ministry of Agriculture. Relieved of its agricultural policing duty, extension personnel committed itself vigorously to African development by promoting commercial crop production of various kinds and employing a variety of group based commodity approaches. Tobacco and tea production was introduced in some Tribal Trust Lands (new name for Reserves), whilst cotton growing and cattle fattening projects spread wide (Bates 1980, Kennan 1980).

Pulling down the Joneses: group extension approaches

Whilst the SARCCUS conference and expert advice on community development approaches by the American Dr Green constituted a refreshing external input to review homebred extension approaches in Rhodesia, internal criticism on the supposed merits of the master farmer programme also emerged. Darrel Plowes, the Manicaland Provincial Agricultural Officer from 1956 to 1982, put the problem of master farmer training as follows:

'You find a progressive individual and you concentrate your efforts on this individual. You get him up to a high standard. He will influence all the others. They learn from him. Say you got a ripple effect. Gradually knowledge spreads out to the rest of the community. But what Alvord didn't realise and most other people didn't realise, and I certainly was amongst them to start with, was that in African society here things don't work that way. We time and again find a chap has been doing well, brought up to master farmer standard, been farming nicely for just a couple of years and suddenly relaxes. People couldn't understand this.'^{ix}

Whereas in European society, a progressive individual would trigger an effect called 'keeping up with the Joneses', Plowes discovered that a master farmer producing a good crop would be

accused of witchcraft, and 'eaten back into subsistence by all his less energetic relatives and friends'. In a nutshell, Plowes

*'realised that the master farmer scheme was not going to be the full answer to getting everybody coming up. They don't keep up with the Jones's, they pull the Joneses back into their ranks. When we really appreciated that, that was when I was then trying to change our approach here and go for group activities. (...) I thought hell! What you got to be doing is to make everybody a Jones simultaneously. Get them all working together.'*³⁹

This new insight augured well with other policy currents stressing the need for group work, easy diffusion of innovations amongst homogenous segments of society and development of communities as a whole. In Victoria Province (presently Masvingo) two CONEX officers translated the idea rather literally by forming Master Farmer clubs, in 1967. By 1969, 38 clubs were operational and an umbrella association at Provincial level was formed. The idea of farmer clubs was to promote farmer-to-farmer extension and allow the numbers of master farmers to grow. When in the early 1970s the Association was allowed to take on and train new aspiring master farmer members, the movement grew exponentially, spilling into Manicaland⁴⁰ and Midlands provinces as well. By 1978 the Victoria Master Farmers' Association comprised 201 affiliated master farmer clubs with about 8,000 members, making up 10 to 15% of all cultivators in the communal areas⁴¹. Many field days and farming competitions were organised by these clubs. The Association also pressed for a better supply of inputs and marketing of produce. The exemption of sales tax on a selected list of agricultural inputs was 'highly prized' (Jordan 1978). This raises questions on the exact purposes of these clubs as perceived by the members themselves: spread of innovations or access to market channels and state subsidies on input supply? Hughes (1974, 119) argues that the main reason for the formation of these clubs was that Master Farmers were dissatisfied with the marketing services provided by state supervised co-operative societies, believing they themselves could provide similar services 'more expeditiously and at lower costs'. In this sense the master farmer clubs may have had a similar attraction and scope as the Native Farmer Associations in the 1930s: catering for the marketing problems of an elite group of producers.

The club movement spread to cover all aspects of agricultural life in the Tribal Trust Lands: co-operative societies, Young Farmers Clubs, women's clubs, grazing management committees, savings clubs, and commodity clubs proliferated across the country (Froude 1974, Kennan 1980, Plowes 1980, White-Spunner 1964).

³⁹ Plowes claimed he first got this idea from a film called 'Food or famine', manufactured by Shell. He had been using this film in extension training activities in the early 1960s. In the film 'there was a scene in India in a village, where people were turning out to dig an irrigation ditch to bring water to a very arid piece of arable land. And there were a couple of chaps beating away on this drum, you know. Some village headman calling them all out, you know. And here were the people coming out in throngs, men and women carrying baskets to carry the soil and picks and shovels. The whole village turning out. Now in a village like that the lazy people could not possibly afford to sit back in their huts and do nothing, you know, when everybody else is working and assisting. They would be the odd man out, with tremendous social pressures on those people for being lazy. Whereas with us the master farmer was the odd one out.' Interview with DCH Plowes, Mutare, 30 November 1996.

⁴⁰ In 1975, within a year's time, 50 Master Farmer clubs had been formed in Mutare district. Increasing hostility towards master farmers put a premature end to this movement in Manicaland (Plowes 1980, 198).

⁴¹ Weinrich (1975, 144, footnote 1), quoting a 1969 report of the secretary for agriculture, claims that 59.4% of all peasant farmers in Victoria Province had attained master farmer status.

Putting the lid on agricultural modernisation: the Rhodesian Front and traditionalist Community Development

The brief period of self-reflection and experimentation with new approaches in agricultural extension was sealed with the rise to power of the Rhodesian Front, stopping feeble attempts at land desegregation⁴² and preventing others than Chiefs from political participation. Alexander (1993, 87) speaks of a 'new orthodoxy' which became entrenched within government departments, even before the Rhodesian Front rose to power in 1965. This orthodoxy

'rejected the possibility of 'modernising' the reserves on the grounds that Africans were too steeped in tradition to accept the rationality of Western science, private property and modern markets. The turn to chiefs brought together the traditionalist beliefs of administrators in search of order, the 'expert' advice of community development advisors seeking 'natural' communities, and white politicians' need for allies other than the nationalist leadership.'

The Community Development policy got off on a bad start when its chief supporter (Howman) resigned in 1964. His replacement (Harper) favoured separate development and restriction of political representation to Chiefs. Delays in the passing of Tribal Trust Lands Act (1967) and Tribal Courts Act (1969) caused confusion within the ranks of implementing agencies. Delineation teams (1962-66), searching for 'natural' communities, only considered chiefs and headmen and relied on them for the identification of 'felt needs'. The position of community development agents was compromised: they were despised by Africans and nationalists since they had previously enforced NLHA regulations, and were disliked by officials at the Ministry of Agriculture since they resorted under the Ministry of Internal Affairs (Alexander 1993, 91-3). But the main reasons for the unpopularity of the Community Development policy were that secondary schools and land redistribution, though urgently 'felt needs', were not addressed by the policy (Bratton 1978, Mutizwa-Mangiza 1985). Furthermore mechanical conservation works, now undertaken under the *aegis* of Chiefs and headmen and their government paid teams of peggers, were considered to be a 'must', not to be confused with 'voluntary felt needs of the community.' (Alexander 1993, 87). Proceedings of African Councils and Community Development Boards were dominated by barely literate Chiefs and headmen at the expense of the aspirations of progressive African modernists, i.e teachers and rural entrepreneurs (Mutizwa-Mangiza 1985, 64).

Whilst the intensification of the liberation war after 1972 led to ever increasing amounts of government control over rural development efforts,⁴³ the final blow to the modernist community development project had already been delivered in 1969, when the Ministry of Internal Affairs resumed control over African agriculture (see table 2.1). Alexander (1993, 100) explains this move in terms of the Administration (i.e the District Commissioners and their intermediaries the Chiefs and headmen) 'sidelining 'development' in favour of control.'

⁴² The Rhodesian Front deputy secretary for development, Nicolle, explained in 1964 that the Land Apportionment Act could not be repealed, as suggested by the Quinton report (1960), since then Africans 'would move into the European areas, and in consequence large numbers of Europeans would leave the Colony and in consequence property values would slump and in consequence (...) production would drop substantially and in consequence the economy of the Colony would collapse.' (quoted in Alexander 1993, 88).

⁴³ Government control over rural production culminated in the despised 'Protected Villages' policy, supposedly to protect innocent African villagers from increased 'terrorist' activity, whilst providing centralised government services in so-called growth points. Africans resented the villages, referring to them as 'keeps' and 'concentration camps'. Instead of winning the hearts of ordinary Africans, the government yielded further disaffection, particularly amongst the previously loyal group of master farmers whose large land holdings were reduced to a piece of communally worked land (see Weinrich 1977, Ranger 1985).

In practical terms this meant that mechanical conservation became the top priority again at the expense of production extension approaches (Bates 1980, 187). In fact, the suspension of the NLHA and its central land use planning package was never effected on the ground in Manicaland.⁴⁴ If anything, the policy of Community Development was experienced in agricultural circles as some form of a tribal revivalism: the authority of Chiefs and headmen was to be propped up to make them effective policemen over agricultural criminals in their traditional courts, and traditional work parties among kin groups (*nhimbe*) were to be revived as a way of community development group work (Plowes 1976, 16).

2.7 CONCLUSION: THE CONTINUITY THESIS OR HOW ALVORD OUTLIVED HIS DAY

This chapter has sketched the basic contours of a sociotechnical intervention model for Zimbabwe's communal areas, as it emerged in the period from 1920 to 1944, and was subsequently scaled up and modified by an expanding technical bureaucracy. The salient aspects of the model still applied in the mid-1990s, and in that sense Alvord's ideas have outlived his day. The content of the intervention model reflects Rhodesian settlers' ideals on segregated development, civilisation, modern agriculture and conservation. The sociotechnical and multi-levelled nature of the modernisation model is outlined below. Finally, some observations are made on the continuities and changes that occurred in agricultural extension policies and state-backed modernisation efforts after Alvord retired.

Ideas and policy imperatives inspiring the model

The constituting elements of the model were shaped in response to a flux of successive policy imperatives of the nascent settler state in Rhodesia. The political objective of racial segregation dictated a break with African agricultural strategies maximising production per unit of labour. The squeeze of the African population in carefully demarcated Reserves required an agricultural strategy capitalising on the unit of land available. The future of European settlement in Rhodesia depended on the success of the nascent settler state to exploit the country's mining and agricultural resources for which the capture of African labour and capital were critical. This necessitated the establishment of administrative control over a vast majority of Africans. In short, African society had to be made legible (Scott 1998). Sedentary settlement of Africans in straight lines on permanent fields (i.e. centralisation) greatly enhanced this capacity for administrative control. Scientific ideas on what constituted modern, sustainable agriculture in temperate regions resulted in the transplantation of a mixed, permanent farming model into the marginal soils of the Reserves (*cf* Sumberg 1998, Wolmer and Scoones 2000). Prevalent settler and missionary ideas on the causal link between African 'superstition' and their purported wasteful and environmentally destructive use of resources combined with a self-imposed European mission of bringing civilisation to a backward, simple people, resulted in the need to break the social fabric making up African society and supplant it with a Christian flavoured society reflecting European moral ideas on gender, nucleus family, and monogamy. Finally, in response to recurrent conservationist alarms on the destructive effects of over-population and overstocking in the Reserves, the model of modernisation embraced a strong emphasis on mechanical conservation (contour ridges).

⁴⁴ The Provincial Agricultural Officer for Manicaland (1956-1982), Plowes, categorically denied that the NLHA had ever been suspended. Interview with DCH Plowes, 20 January 1997. Furthermore an extension assistant, operating in the Save valley in the late 1960s and early 1970s, claimed that mechanical conservation, and the demarcation of arable and grazing lands in Chimanimani district's low lying wards started only in earnest during that time. Interview with agricultural extension worker Mutede, Biriwiri, 18 September 1996.

Characterising the persistent sociotechnical intervention model

Alvord's modernisation model epitomises a process of simultaneous social *and* technical engineering aiming at a thorough re-arrangement of a wide spectrum of social, moral, economic and material elements making up rural African livelihoods. Thus the modernist transformation of African kin-based society into self-contained villages comprising nuclear Christian households producing for the market is closely tied to a process of technical transformation as manifested in square houses, contoured fields, lined villages and agricultural production strategies that maximise on the unit of land used. The model reflects an ideal mode of ordering affecting all aspects of African rural life, transforming landscapes, homesteads, fields, family composition, household economy, hygienic and gender practices. The model is multi-levelled in both space and time. It spells out a linear evolutionary path of improvement at household and Reserve level mimicking European styles of agrarian development at a small scale. The policy of racial segregation precluded Africans from realising the benefits of European life to its full extent. The scale of the model was that of a smallholder subject to containment within the Reserves. The African was never supposed to commensurate European wealth and compete with his large scale commercial counterpart at a level playing field.

Continuity and change in approach to modernisation and agricultural extension

The modernisation model at the level of both household and communal area has remained virtually unchanged since its launch by Alvord and his programme. The underpinning conviction, based on 'scientifically' calculated carrying capacities, that communal areas harbour agricultural potential which can be further developed to the benefit of its inhabitants, if only the right technology, approach and commitment can be found, is still dominant. This belief served during both the colonial and post-independence era (up to 1997) to curb demands by the indigenous population for more and better land. The validity of the smallholder model had already been confirmed by the Riddel (1981) and Chavunduka (1982) commissions, defining the post-independence agricultural modernisation policy. This is ironic if one considers that the liberation war and the supporting role of peasants in this war had been largely informed by a desire to return the land to the Africans and keep the 'peasant option' open (Ranger 1985). The 'peasant option' was restricted again to the model of the master farmer, which became the building block underpinning the dominant model A resettlement schemes undertaken during the first decade of independence.

Agritex, the new national extension service that was the result of a 1981 merger between CONEX and DEVAG, embraced the mission of commercialising the smallholder farmer making use of persuasive extension approaches relying to a large extent on the basic tenets of Alvord's demonstration programme. Upscaled and standardised master farmer training, field days, and agricultural shows were supposed to demonstrate and celebrate the virtues of the master farmer model to subsistence farmers operating in over-populated and over-stocked communal areas. After a slow-down in the resettlement programme in the late 1980s, communal area re-organisation was embarked on. Land use planning along the lines of the NLHA⁴⁵ was, again, supposed to obviate the need for releasing more farming land to the smallholder sector (Drinkwater 1989). One can speculate on the reasons for these continuities. Drinkwater (1991) emphasises the role of a persisting technocratic rationality inculcated in Zimbabwe's inherited state agencies. Alexander (1993) seems to argue that the farming model underpinning the NLHA modernisation policy was never challenged on its technical merits. Being the only model for smallholder modernisation available on the shelf,

⁴⁵ This policy became popularly known as the 'internal resettlement programme' (Alexander 1994).

made it susceptible to re-adoption, certainly after the adoption of the 'Growth with Equity' policy (1981), which largely left the dual character of Zimbabwe's agricultural sector in tact. In this policy commercial agriculture had to provide the funds necessary for the state-backed modernisation project in the communal areas and newly created resettlement areas. The next chapter will delve deeper into this matter.

Over time agricultural extension in communal areas swung in between a strategy relying on control by traditional leaders fostering the social fabric of African kin-based society, back and forth to a strategy that relied on radically breaking the traditional ties of that society by fostering the modern Africans moulded along Alvord's missionary ideals of individual agricultural entrepreneurship and leadership based on merit. The movement of the pendulum was dictated by the government agency ruling the day, modernist Agricolos fighting it out with traditionalist Administrators. After independence the pendulum swung back in favour of Alvord's modern men, at the expense of African traditional leaders. The latter had run out of favour with the new political leadership that had waged the war, and closely identified traditional leadership with Smith's regime (Ranger 1985).⁴⁶ Resettlement schemes were designed to be void of traditional leadership, popularly elected village development committees were manned with party supporters and influential modernist farmers, and overall authority was vested in the hands of the secular state, represented by the resettlement officer.

The actual methods used to propagate the master farmer model were also subject to movements of a pendulum, swinging between forceful implementation and persuasive demonstration. Whilst Alvord initially developed a persuasive 'seeing is believing' approach relying on a multiplier effect triggered by visual demonstration, at a later stage he succumbed to conservationist pressures to enforce the improvement model at a Reserve wide scale. The attribution of the failure of the NLHA on a lack of appreciation of the 'human factor' allowed the introduction of persuasive methods of extension relying on the virtues of a process called diffusion of innovations. Subsequently group extension approaches won the favour of the day, re-introducing the emphasis of administrators on gradual and slow elevation of Reserve population to a higher economic plain. This provided a break with the missionary strategy fostering progress of individual entrepreneurs, that had become inculcated in Alvord's demonstrator programme, and had already been considered 'dangerous' to the segregationist development ideals of Administrators back in the 1920s. The typical traditionalist elaboration of the community development policies after 1965 led to the adoption of persuasive group approaches mixed with forceful implementation of mechanical conservation measures, which were considered a *sine qua non*. After independence, Agritex operated a variety of extension approaches of which however the master farmer training programme formed the core element. To what extent this programme was successful in practice in achieving the broad aim of commercialising smallholder agriculture, and to what extent the master farmer model met the aspirations of Alvord's modern men, is the subject of chapter 3.

⁴⁶ The role of traditional leaders in supporting the Smith regime was a lot more complex and contradictory than that of government stooges (Alexander 1993, Kriger 1988).

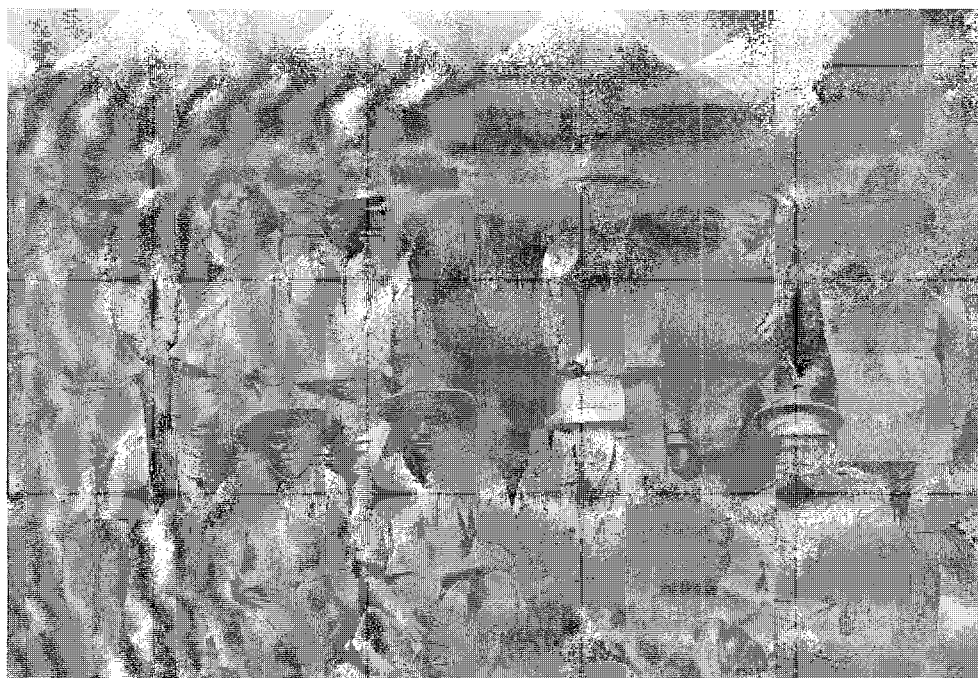


Photo 4: First class of demonstrators and staff at Domboshawa, 1927
(Source: National Archives of Zimbabwe photo collection no. 8807)

DEMONSTRATORS & THEIR WEALTHY FOLLOWERS: THE MODEL OF THE MASTER FARMER IN PRACTICE

By the 1990s many communal farmers in Zimbabwe had observed a change in the services delivered by Agritex extension workers. In the eyes of the communal farmers some extension workers did not visit farmers' fields as often as they used to, spent a lot of time writing reports in their offices and most importantly did not practically demonstrate the knowledge and skills they tried to impart on the farmers. According to many of the older farmers, Agritex extension agents stand no comparison with their predecessors, the demonstrators. One communal farmer in Makoni district noted: 'the profession of extension worker has become a white-collar job nowadays'. This apparent change and decline in effectiveness of agricultural extension was also felt in some quarters of Agritex. During a workshop for Agritex extension workers and supervisors in Manicaland in 1995, a District Agricultural Extension Officer confronted his audience with a riddle:

'What is extension? Passing on of new ideas from research stations to farmers. Let me ask you something else: How many farmers attend your meetings? Aha, very few (...) Why? Because they know (...) The point is that we have run out of ideas. If you run out of ideas it is time to disappear. If you don't disappear, the farmers will.'

The riddle defines extension as a diffusionist process of transfer of technology, skills and practices (new ideas) from its place of origin, a scientific community contained in the orbit of research stations, to its destination, a community of farmers, eager for new ideas. If one were to ask an agricultural extension worker in the mid-1990s what his main methods were to improve smallholder agriculture in his area, the obvious answer would have been: the master farmer training programme, field days and agricultural shows. This is striking since those methods of agricultural extension gained prominence in Zimbabwe during Alvord's days. The previous chapter ended with an outline of the agricultural intervention model that has come to dominate Zimbabwe's smallholder sector ever since the start of the work of Alvord. This chapter intends to show how its persistence was achieved by assessing in more detail the methods, ideas and practices that made the master farmer programme the pivotal element of the intervention model at field level. At the same time the chapter tries to assess whether the model of modernisation was successful in achieving its aims of creating a vibrant, modernist class of African smallholders mimicking their large-scale European counterparts.

The chapter opens by looking into the success and upward mobility of master farmers and early generations of demonstrators. It does so by tracing in what ways these two categories of actors differed in strategies of wealth accumulation, from ordinary African peasants. As will be shown, it was not just a matter of adopting the right agricultural practices. Equally important was a new outlook on life and the benefits of manual labour. State support for this new type of modern, Christian African farmer led to the opening up of further beneficial avenues for demonstrators and their followers, as will be shown by tracing the careers of a number of young and old extension workers. The next section (3.2) seeks to establish the

central tenets of any post-1950s extension service: the transfer of technology (TOT) paradigm. Some of the features of TOT make up major elements of the master farmer programme, though these are locally grounded in the practices and methods that Alvord initiated. The exact features of the World Bank pushed TOT approach may not have rooted in Zimbabwe, but the ideas behind the approach were firmly in line with the dominant extension approach in Zimbabwe, certainly after the merger of CONEX with DEVAG into Agritex.

The third section of this chapter turns to Chimanimani district in the mid-1990s, to assess the meaning and effects of master farmer training, field days and agricultural shows in the various agro-ecological settings of Nyanyadzi river catchment. The section shows the ritual character of these three tenets of agricultural extension, which still form the linchpin of Agritex' mission to commercialise smallholder farmers using the image of their large-scale commercial counterparts. Despite their importance as heroes of progress and proof of Agritex' relevance, very little master farmer training is actually done by Chimanimani's extension workers. It is claimed that the model of the master farmer represents a mode of ordering (both material, social and ritual) that acts as an icon of modernisation. However, the trickle down effect (extension) to the mass of communal area dwellers does not occur. In two case studies involving master farmers the exclusionary features of the programme are highlighted. The first case study (3.4) assesses the relationship between field days and master farmers. Master farmers prove to be crucial actors for the reproduction and performance assessment of individual extension agents and their extension practices. A close look is also taken at agricultural shows in Chimanimani. These shows, both at area and district level, have a highly ritual character where hardly any learning takes place. The second case study (3.5) assesses the active use that master farmers make of their relationship with extension workers and their image as good farmers, to gain access to state mediated resources, like land, water rights, loans and cattle. Aspiring to be a master farmer has less to do with practising agricultural methods that Agritex propagates, than with a desire to expand one's security and wealth by means of a master farmer badge which provides a ticket to state resources like the heifer loan scheme that aimed to restock cattle herds in communal areas.

3.1 CHRISTIANITY AND THE ACCUMULATION OF AGRICULTURAL WEALTH: EARLY MASTER FARMERS AND THEIR ESCAPE FROM THE RESERVES

The model of intervention, outlined in chapter 2, establishes a link between Christianity and agricultural improvement, as a crude attempt to break with an earlier established wisdom that poor agricultural practices are a product of superstition. Demonstrators often used Christian metaphors, explaining their work in terms of *converting* African cultivators into Christian farmers.¹ Alvord's modernisation programme involved a mix of scientific rationality and Christian morality, which in his development vision would produce improved farming practices and self-supporting communities. Part of the vision was the emergence of a modern class of African leaders and associations that could articulate their own desires, serve as an example to other Africans, and provide services to their communities. These leaders would rise by developing modern skills and abilities, not on the basis of royal descent or mastery of the spiritual world. Despite the limited impact that the demonstrator programme had achieved in terms of numbers of African cultivators influenced by the time of Alvord's retirement in 1950, the programme did produce a class of 'modern' Africans, who pursued new aspirations and managed to accumulate wealth on the basis of 'improved' agriculture. In this section we will turn to these 'modern Africans' and examine their fate.

¹ One such demonstrator once told me that if a cultivator is found to be mixing different types of crop seeds in one field, 'he is not a Christian in the farming yet.'

Demonstrators and mission Christianity: Alvord and the Mount Selinda network (1930s)

The fling between Christianity and modern agriculture dates back to the start of the work of the American Methodist Mission in Mount Selinda, Chipinge district, established in 1893 (Zvobgo 1996, 6). Mount Selinda missionaries sought 'to develop the whole man (...) to teach a man how to live in this world, and not be satisfied with merely converting him' (Rennie 1973, 302). Rennie notes that the early Mount Selinda students, upon completion of their education, left the Mission to make money in towns and mines, thus exploiting the benefits of their qualifications (which earned them better wages). From 1902 onwards many of these mission-educated workers returned and used their acquired wealth to build themselves permanent houses and marry at the Mission. Soon this nascent elite started to press for freehold land, and when they could not get this, turned to agricultural improvement and other economic opportunities as a means of sustaining their wealth. Thus even before Alvord's arrival at Mount Selinda (in 1918) a small group of improving farmers had started to make headway. Rennie asserts that Alvord's importance lies not in instilling new attitudes in African farmers but in giving this new agricultural elite encouragement and official status (Rennie 1973, 522-27). Initially aspiring demonstrators and their followers almost exclusively came from Mission stations and surrounding areas (see Photo 4).² They were part of a group of people that had adopted a new belief, Christianity, and elements of a concurring view on life, stressing the benefits of education, hard work and production for the market.

Table 3.1: Origin of demonstrators, 1924-1930

Dutch Reformed Church	2
Church of England	2
Roman Catholic	2
London Missionary Society	1
Wesleyan	3
Brethren in Christ	1
American Board (Mt Selinda)	25
Tjolutjo School	4
Domboshawa School	8
Native Commissioners	6
Total	54

Source: Alvord (1930, 13).

Two thirds of the first batches of demonstrators originated from Mission stations, whilst nearly half of them came from Mount Selinda Mission (table 3.1). In later years Alvord would continue to draw new demonstrators and even supervisors from his Mount Selinda network of relations. All of the early Mt Selinda demonstrators had a rather personal relationship with *Nkosi* Alvord, not in the least because Alvord had known them as students or missionary workers from his days at Mount Selinda. These Mount Selinda men appealed for his help whenever they met a problem in their life or career. By 1947 former Mt Selinda students still made up 34% of all supervisors and over 15% of all demonstrators¹. A good example of one such 'new man' is Zito Sigauke (see box 3.1). In a way, Zito Sigauke's career embodied the ideals Alvord hoped to promote. Zito shared these characteristics with other early demonstrators originating from the predominantly Methodist missionary base in Melsetter district.³ They became outstanding, moderate African leaders representing modern African opinion in the new Native Councils formed in the mid-1930s (Phimister 1988, 197).

² See also the reference to the so-called *vatendi* (European dressed African supporters of improved agriculture) in Alvord's article 'The great hunger'.

³ Melsetter district contained three Methodist mission stations in Mt Selinda, Chikore and Mutambara.

Box 3.1: The life and career of Zito Sigaukeⁱⁱ

Zito was born in the 1870s as a grandson to Pashipaama, a former warrior and headman under Chief Mapungwana. Zito was orphaned at a young age and sent to Mount Selinda mission in 1893 as one of its first African students. Upon entering the mission, Zito was given a European outfit consisting of a jacket and shorts. To earn his school fees Zito worked in a mine in Lower Gwelo during school holidays. In 1898 Zito passed standard 5, being the best student in his class. He was elected the church treasurer and went back to the mine in Lower Gwelo for a few years, before he returned to Mount Selinda to marry and become only the 4th Ndaui teacher to be recruited at the Mission (at a salary of only one fifth of his mine wages). He was unique in the district for owning a bicycle and licensed shotgun in 1904. The ever-increasing qualifications required to maintain his post as teacher, forced Zito to look for other jobs. He learned type writing and produced a book in Shona at Chikore mission. He worked as a court interpreter for the Native Commissioner of Chipinge for a year. Returning to Mount Selinda mission he took up a job as carpenter and building supervisor. This is when Alvord arrived on the scene.

After the devastating drought of 1922, Zito assisted Alvord in building an irrigation furrow to Zona tea estate in 1923 to provide food for the Mission. When Alvord looked for new recruits for the demonstrator course at Domboshawa in 1929 he asked Zito Sigauke to join. After completing the course in 1931, Zito was deployed as a demonstrator in Mutema irrigation scheme, which was under construction at the time. Alvord was impressed with Zito's efficiency as a supervisor of the construction work and in 1933 he was promoted to become one of the first four (district) agricultural supervisors, entrusted with monitoring and supporting the work of all demonstrators in Eastern Rhodesiaⁱⁱⁱ. Sigauke's wage taking increased from an already substantial £4 to £6 per month, the equivalent of about 24 bags of maize that time. Zito Sigauke operated as a kind of troubleshooter on the various irrigation schemes that cropped up in the 1930s (Nyachowa, Mutema, Nyanyadzi, Mutambara, Umvumvumu). These early endeavours in irrigation were characterised by many infrastructural setbacks and problems with in-experienced plot holders. Sigauke proved himself capable of correcting these errors with 'quick fixes', whilst continually keeping Alvord informed. So when Alvord sought permission to appoint 'an older, more forceful and more experienced man' to back up in-experienced demonstrators in irrigation projects, he proposed to select Sigauke^{iv}. In 1936 Sigauke became the first irrigation supervisor in the country. Not everybody appreciated the steadfast career of Zito Sigauke. In 1939, after some trouble on Nyanyadzi irrigation scheme with beer-drinking plot holders neglecting their wheat crop, it was decided to appoint a European supervisor for irrigation schemes. This curtailed Sigauke's responsibilities, as he was now answerable to a white superior. Soon letters of discontent reached Alvord. Sigauke was blaming his superior for not delegating powers to him, whilst the European supervisor (later LDO) complained of untrustworthy staff. The matter came to a head in April 1945, when the houses of both Sigauke and an agricultural demonstrator were burnt to the ground in Nyanyadzi irrigation scheme. Sigauke put the blame squarely on the LDO's careless talks and overt dislike of Domboshawa trained African staff. Sigauke made an emotional appeal to *Nkosi* Alvord: 'Please turn your face and ears and listen to our cries. Where shall we run to, you are the only one to release us from such trouble.'^v Alvord suggested the LDO 'make full use of his African technical staff' or else be transferred^{vi}.

In 1946 Sigauke was transferred as supervisor to the newly constructed Devure irrigation scheme. By that time he had acquired over 100 head of cattle, which he was forced to sell, since staff regulations did not allow for more than four or five heads of cattle per supervisor. Once in Birchenough Bridge, Zito asked his son Mathias to join him in running an engine driven grinding mill *cum* grain dealers' store. By the time of his retirement in the mid-1950s, Zito Sigauke had founded three Methodist Churches and was driving in his Chevrolet to church every Sunday. Despite the fact that Zito originated from a chiefly traditional family, he never went for ancestral worshipping. In Christian Methodist fashion he taught his children to value hard work and education. Zito invested heavily in the education of his children. He sent all of his 10 children to Mount Selinda mission school. Two of his sons became demonstrators and one daughter married a clerk in Alvord's Salisbury office. Another son became one of the first students at the first African secondary school in Goromonzi and now stays in the USA, having attained his Masters degree in Administration.

These modern men often experienced intense upward mobility, enjoying unprecedented levels of material wealth, which they in turn invested in purchase farms, irrigated farming, agri-businesses and cattle, but above all invested in the education of their children.⁴ The latter became known as the educational strategy of modern African farmers, seeking to 'reproduce and enhance their elite status through their children, specifically through their sons' (Shutt 1995, chapter 8).

The basic idea behind the strategy was that educated sons would contribute to the family farm by providing capital and expertise, thus expanding the family enterprise (see Ranger 1985, 1995, Weinrich 1975). Following in the wake of their agricultural teachers, early master farmers formed leadership associations organising agricultural shows (see box 2.2 on Chiota), constituting a vanguard of modernity as reflected in their rectangular brick houses and European dressed children paving their way through Mission schools. During the national food production drive, an exercise in state planned food cropping in the Reserves to make up for maize shortages experienced after World War 2 (1950-53), master farmers were employed to perform the same role as demonstrators.⁵ Close ties emerged between demonstrators and master farmers as the former were forced to concentrate their efforts on relatively wealthy farmers⁶ and found more easy access in case African cultivators had been exposed to some form of mission education or church membership.

Second generation demonstrators and master farmers: escape from the Reserves (1940s & 50s)

Demonstrators formed an aspiring elite that looked beyond their pay-slip for improving their livelihood. Many went for farming, acquiring Native Purchase Area farms or settling in one of the new irrigation schemes. Others went for (agri-)businesses, operating local tuck shops and grinding mills. Some embarked on these activities only after retirement, others did so after resigning from their job, and again others combined the running of a purchase farm with their job as demonstrator for the area.⁷ When the going got tough, during the implementation of the Native Land Husbandry Act (NLHA), many demonstrators resigned and left for Northern Rhodesia, where plenty of land was available, or alternatively they left for Native Purchase Areas. Often they were accompanied by their leading plot holders and master farmers, who also felt constrained in their ambitions by the rigid NLHA stipulations on

⁴ Alvord's four most trusted Mount Selinda adepts (Sigauke, Hliziyo, Muyotcha and Mlambo) rose through the ranks of demonstrator, supervisor and native instructor during Alvord's reign. All, except Sigauke, retired as farm owners in Native Purchase Areas, using their agriculturally based wealth to invest in the missionary education of their children. Interview with Mathias Sigauke, Birchenough Bridge, 5-6 March 1998.

⁵ From 1951-55 at least 700 so-called supernumerary demonstrators were employed annually to 'supervise' major agricultural activities like winter ploughing, manuring, planting and weeding. The supernumeraries were drawn from the ranks of master farmers and plot holders. Amongst other things they were responsible for the vigorous propagation of new hybrid maize seed in the Reserves. See annual reports Department of Native Agriculture.

⁶ Alvord wanted his demonstrator staff to be exemplary, and for that reason operated a strict policy of firing low performing and morally incorrect behaving demonstrators. During the first 20 years of the demonstrator programme (1927-1947) Alvord fired on average some 3 demonstrators per annum (2 to 10% of their total number).

⁷ In 1939 the Director of Native Lands called for urgent placement of full-time demonstrators in NPAs 'in order to save the land.' Alvord hesitated since his agricultural supervisors on visits to NPAs had noted that farm owners were mostly absentee, and farm wives paid little attention to agricultural advice. From 1940 onwards a 'school of agriculture on wheels' started operating in NPAs. In 1943, a new policy was drafted, allowing farm owning demonstrators to be appointed in their own NPA Division after at least 10 years government service.

maximum allowable land and stock holdings. Their escape from the Reserves was as much motivated by their growing unpopularity as agricultural policemen (demonstrators) and stooges of the restrictive Rhodesian regime (master farmers), falling prey to public attacks at the height of the nationalist inspired resistance against the NLHA. The 1953 policy to accept only master farmers for new purchase farm allocations gave aspiring Reserve cultivators a publicly endorsed incentive to join the modernist project and escape the vagaries of the Reserves.⁸ How the escape from the Reserves into modernity was perceived and shaped by demonstrators themselves is assessed below for the case of two fathers of extension workers operating in Chimanimani district anno 1996. Their escape led them to Chesa small-scale commercial farming area, located in the North East of Zimbabwe.

Demonstrator Chikazhe, operating from 1946 to 1956 in various Reserves, had a mind of leaving the job, in spite of the security offered by his salary that exceeded the monthly takings of other civil servants like teachers and policemen. In his view, his job amounted to little more than

'working for a ticket. If you work hard, you get some money. If you don't work hard, still the money is sent. But if you are doing your own work, you work, you get more money. If you don't work hard you get less money.'

Equally important in his decision to leave the department was his categorical refusal to act as some kind of agricultural policeman. Furthermore he had observed that some farmers in NPAs 'were getting more money per year' than he was earning. Chikazhe left the department in 1956, despite being offered promotion to the post of agricultural supervisor. At first he started trading fish in Northern Rhodesia using a truck he had bought with the proceeds of his salary. He wanted to go for farming in Northern Rhodesia, but his brother refused, since it was too far away. In 1958 he settled for a NPA farm in Chesa and took some of his leading master farmers in his wake.^{vii} His neighbour in Chesa, Kondo, son of a wealthy master farmer, decided to look for an NPA farm after ten years of demonstrator work (1956-1966). His motivation was similar to that of Chikazhe. Kondo considered his pay low, compared to what some of his best farmers were getting. In 1964 he got a NPA farm in Chesa, which was initially occupied by his ageing father. In 1966 Kondo himself settled in Chesa accompanied by eight master farmers from his last working area in Mazowe.^{viii}

Despite the fact that both Kondo and Chikazhe were Methodists and firmly committed to the ideals contained in the master farmer model, they used different strategies to develop their farms. Kondo married three wives, built up a large cattle herd and was hampered in capitalising the farm to the full by the dissipation of the necessary funds into the education of his many children. Family labour was no limiting factor in his agricultural strategy, but finance for the construction of farm buildings; a dam or acquisition of a tractor never materialised. In contrast, Chikazhe operated a capital intensive farm development strategy, which was however constrained by a lack of family labour. He started modestly by stumping his land and growing *rapoko* and maize for sale. Thereafter he went for cotton growing. Real success came with the cultivation and processing of bale tobacco after 1966. The tobacco money was used to educate Chikazhe's eight sons and two daughters, finish construction of a large family home, local dam and other farm buildings (tobacco shed). After the war had ceased, farm operations reached their zenith with the acquisition of a tractor, financed

⁸ This policy was meant to address the low productivity of purchase farms. In 1953 it was found that out of some 5,000 NPA farms, only 3,242 were reached by extension services. Of the latter farms only a meagre 61% attained the same production levels as plot holders in the Reserves. Annual report Department of Native Agriculture, 1953.

through a loan from the AFC and the cash remittances provided by his children occupying professional jobs in town. Chikazhe's wife trained as a village community worker in Domboshawa and contributed to the development of the family home by installing solar panels, a biogas tank and improved kitchen facilities. In the early 1990s farm operations ceased to a bare minimum, like the majority of farms in Chesa. Old age and a tractor breakdown forced Chikazhe to stop tobacco production and scale down cotton cultivation.

Yet the spirit for agricultural advance imbued in Chikazhe, Kondo and their network of former master farmers had not died. Seven farm owners formed the Chesa Ostrich Producers Syndicate in 1994. Moderated by one of Chikazhe's sons, who worked as a provincial NRB officer, an NGO (Africa 2000) assisted the syndicate to construct paddocks and a plant for hatching ostrich eggs. Whilst most of the farms in Chesa were 'dying', this small group of modern Christian men, inspired and shaped by Alvord's modernisation model, was again in the lead, exploiting another venue for commercial production for the export market.

The story of these two demonstrators sums up the trials and tribulations of a generation of Alvord's modern men. Whilst fulfilling the aspirations and actively shaping the modalities of Alvord's modernist project, this generation also marked the failure of the project in the Reserves. Adoption of an agriculturally based idiom of accumulation led to an escape from the Reserves by its proponents, rather than improvement and development of the (communal) area they originated from, through a process called trickle-down. Many of the ventures that this generation embarked on, whether it was the running of a farm, irrigated plot or agri-business, flourished and demised within their life-time. Ultimately their modern life-styles were sustained by the success of their educated children. Many children from NPA farms opted to go for an agricultural career, certainly after Chibero agricultural college opened its doors in 1961 for the education of African officers. The latter in due time came to form the middle cadres of DEVAG and Agritex, vigorously pursuing the ideal of the master farmer model after independence. In Chimanimani district *anno* 1995, three out of four Agritex officers were sons of NPA farmers and many of the experienced extension workers had been raised on either an NPA farm or an irrigation scheme.⁹

Christianity and agricultural success: modern versus traditionalist idioms of accumulation

Whilst the above cases point at the emergence of a 'class' of modern Africans that based and sustained their wealth on a combination of Alvord's package of agricultural practices and Christian morality (*cf* Cheater 1984, Weinrich 1973), the question is whether there is an inevitable link between Christianity and agricultural success, as suggested by Alvord and his successors. Reifying tendencies amongst researchers that subscribe to the modernist project of either the state (i.e. Theisen) or the mission (Weinrich) cloud the debate around this question¹⁰. The fact that agricultural and administrative reports measure agricultural progress solely in terms of adoption of the practices contained in the Alvord package, does not help in allowing independent assessment and qualification of agricultural success.

⁹ This can not be said of the post-independence generation of extension agents that made up the majority of Chimanimani district staff during the mid-1990s. These mostly originated from communal areas, but neither of them wanted to pursue a career in agriculture. Yet, a lack of alternatives combined with the job security offered by the civil service, made them opt for Agritex.

¹⁰ Weinrich (1975, 307), a Jesuit researcher on rural African development, equates African agricultural success with being non-traditional, Christian and educated, which is just another way of saying that mission Christianity is the key to success. Weinrich (1975, 308) closely identifies with Alvord's modernisation model when she states that agricultural success correlates with possession of a master farmer certificate, i.e. those who have broken with their tribal past, and expend most on seed, fertilizer, insecticides and labour for their farming operations (see also Weinrich 1971).

Bourdillon (1983) claims that the introduction of Christianity is often accompanied by the development of stratified, individual patterns of accumulation of wealth, by cutting redistributive kinship ties.¹¹ Theisen (1973, 1975a&b, 1979) did quantitative surveys in four communal areas and established crude correlations between (a) poverty and traditional religion; (b) improved farming and (mission) Christianity; (c) higher education and Christianity; and (d) higher education and economic success. Unfortunately Theisen's work does not delve into the mechanisms responsible for these observed correlations. A more qualitative and historical account of the influence of mission Christianity of different denominations on patterns of economic development is provided by Ranger (1987) for pre-independence Manicaland province. Ranger (1987, 44-6) observes that Methodists pursued economic transformation through agricultural entrepreneurship, whilst Anglicans pursued an ideal of egalitarian development of village communities. Finally Catholic missions were after modernisation through education and labour migration. After independence these clear lines of spatial divergence in mission inspired rural development patterns became blurred, since mission educated men and women started filling professional and bureaucratic posts across the country, whilst the rather exclusive role of mission stations in providing education to the population was taken over by non-denominational government schools. Daneel (1974) further differentiates the Christian landscape, observing a prevalence of mission Christians in the professional job sector, whilst members of African independent churches owned more livestock and produced greater yields than mission Christians or traditionalists in the agricultural sector.

Cheater (1981, 1984) adds another dimension to the Christianity-agricultural wealth debate by introducing the notion of *idioms of accumulation*. In her studies of Msengezi African Purchase area, she differentiates between a traditional and a modern mode of accumulating agriculturally based wealth. The traditionalist idiom as pursued by members of the African independent *Vapostori* church takes its inspiration from indigenous African practices of polygynous marriages combined with *nhimbe* work parties thus producing an abundance of (family) labour for undertaking extensive under-capitalised agricultural production ventures. In contrast, the modern idiom is practised by mission educated families engaged in monogamous marriages, relying on hired labour and practising capital intensive modern agriculture according to the lines spelled out by Alvord's improvement package. In Msengezi *Vapostoris* proved in general to be more successful in achieving agriculturally based wealth than Alvord's modern men.

In conclusion, it can be observed that rather than couching the debate in terms of an inherent link between Christianity and agricultural success, the debate should focus on different idioms of accumulation of agricultural wealth. These idioms reflect particular farming styles (Van der Ploeg 1990, 11-12) that seek to combine different social, moral and technical elements into a coherent mode of organising agricultural production. A stark differentiation can then be observed between modernists like demonstrators and master farmers following the Alvord package, and traditionalists employing a different agricultural strategy.¹²

¹¹ Cf Long (1968) who writes on the agriculturally based success of Jehova entrepreneurs in what is presently Zambia.

¹² Yet it can be observed from the example provided by Kondo that demonstrators too employ a traditionalist idiom of accumulation (particularly to establish themselves on a new farm). Demonstrators and master farmers do not automatically and exclusively adopt a modernist idiom or farming style, though empirical evidence suggests that they are most likely of all farmers to do so.

3.2 THE TRANSFER OF TECHNOLOGY MODEL AND AGRITEX' EXTENSION APPROACHES

Commercialise the smallholder: CONEX and DEVAG merge into Agritex

At independence two completely different extension services were operating in Zimbabwe's segregated agrarian economy. CONEX was a relatively small outfit, consisting of 180 professionally trained officers, servicing a motivated and agriculturally experienced clientele of 6,500 large-scale commercial farmers and about 8,000 small-scale commercial farmers.¹³ The department consisted of a technical and field branch, decentralised at provincial level, employing a commodity based extension approach to farmers organised in product associations. Mechanical conservation was done with help of voluntary Intensive Conservation Area committees. Subject matter specialists were kept abreast with agricultural innovations by means of in-service training courses and temporary seconding of specialists at research stations. The emphasis of the extension approach was on exchange of information and response to specific farmer demands (Madondo 1992, Pazvakavambwa 1994). In contrast, DEVAG was a command and control type of outfit, which put heavy emphasis on mechanical conservation of arable lands in communal areas and promotion of the Alvord package of agricultural modernisation. The official aim of extension was to help people help themselves, by taking their own decisions. In paternalist fashion, DEVAG assisted the smallholder farmers merely 'to make the correct decisions by supplying sound technical information and motivation' (Plowes 1976). DEVAG consisted of only one branch, marrying technical and administrative services in a three-tier office structure at head office, province and district levels.

The 1981 merger between the two services saw the birth of Agritex, with a structure that strongly resembled that of CONEX. Agritex consisted of a director and two assistant directors heading a large field branch manned right down to (sub)district level, and a technical branch with subject matter specialists up to provincial level. In 1988 a third assistant director and branch for agricultural engineering (irrigation) was added.¹⁴ The merger was like the mixing of two different blood groups: some pleasant co-habitation occurred whilst the formation of small and large blood clots blocked smooth running. The policy of rapid Africanisation of the top brass produced disaffection and frustration amongst sceptical CONEX officers. The emphasis on commodity specialisation and ongoing professionalisation amongst the officer corps was experienced with disdain by former DEVAG cadres that valued hands-on experience in working with Africans over and above the collection of paper degrees (Madondo 1992, Pazvakavambwa 1994). The span of the new organisation was formidable, which in practice meant that the Agritex extension worker often formed the starting point and finishing line of any development initiative undertaken in rural areas. Agritex' omnipresence also invited all kinds of administrative, regulatory and drought relief burdens being off-loaded on its back by an independent state eager to please its hopeful electorate, whilst at the same time trying to control and contain its aspirations.

The focus of the post-independence extension service shifted from large-scale commercial agriculture to an explicit focus on commercialising smallholder agriculture in resettlement

¹³ These farmers were formerly known as Native Purchase farmers.

¹⁴ The irrigation division continued to grow in influence and financial clout during the 1990s. Besides supplying the two longest serving directors of Agritex (Pazvakavambwa 1988-91 and Makadho 1992-2002), the division ultimately managed to outgrow Agritex. In 2002 it was split into two fully fledged Departments: the Department of Irrigation under the aegis of the Ministry of Water Development and Rural Resources, and the Department of Agricultural Engineering in the Ministry of Lands and Agriculture.

and communal areas, reflecting the political priority of the day. The overall objective of Agritex was:

'to implement the agricultural policy of government through the provision of agricultural, technical and extension services, which stimulates the adoption of proven agricultural practices leading to increased, sustained and profitable production.'

As Drinkwater (1991, 234) argues this statement spells out the means (adoption of proven practices) of achieving the overall goal (increased, sustained and profitable production) in typical diffusionist fashion. Agritex thus firmly embraced the Transfer of Technology (TOT) paradigm in extension (see box 3.2). New technologies or 'proven practices' were to be generated by the Department of Research and Specialist Services at research stations. Subsequently Agritex would transmit these technologies to its clientele, which then adopted or rejected the packages on offer. The adoption rate presumably determined the amount of success in reaching the overall goal.

Meanwhile the actual contents of the agricultural improvement package remained largely the same: the Alvord initiated model of agricultural modernisation was still expected to work miracles. The Riddell (1981) and Chavunduka (1982) commissions on agrarian reform confirmed the central tenets of the technocratic development policies enshrined in the NLHA (Alexander 1994, Drinkwater 1991). Poor land husbandry was still regarded the main problem in communal areas, whilst low productivity was blamed on traditional tenure, poor farming practices and labour migration (Alexander 1994, 332).

The resistance to past agrarian policies was explained in terms of the methods of implementation (use of force), not their inherent flaws. The answer to inequitable land distribution, poor soils, poor farming methods and over-population in communal areas, was a combination of resettlement and the inculcation of good farming practices in smallholder agriculture. The 1981 'Growth with Equity' policy relied on the growth of the commercial farming sector to generate the necessary public finance to allow for the expansion of social services in the communal areas (i.e. increased provision of schools, credit and market outlets, and extension services) as well as the acquisition of white farm land for resettlement purposes (honouring a 'willing buyer, willing seller' principle).

Initially the policy seemed to pay off, seducing some to declare that Zimbabwe's smallholder sector was witnessing an 'agricultural revolution' (Rukuni and Eicher 1994). Cotton and maize production rose dramatically as a consequence of access to government credit facilities and the spread of new marketing depots in rural areas. By 1985 communal farmers produced and sold more cotton to the Cotton Marketing Board than their large-scale counterparts (Rukuni 1994). However, the success was not carried across the board. Over half of the marketed maize production from 1980 to 1988 originated from six well-endowed districts out of a total of 53 (Stack 1994, 261). And even within those districts the bulk of excess production originated from a minority of resource rich smallholder farmers (Stack 1994, 262, see also Cliffe 1988). A majority of smallholder farmers still produced at subsistence level sustained by financial remittances generated by labour migrants.

Box 3.2: The TOT model and emergence of alternative extension approaches^h

The basic premise of the TOT model is that substantial increases in agricultural productivity can be achieved through the transfer and dissemination of (new) technologies. The model consists of three components, each performing a distinctive role in a linear process of technology generation, transfer and utilisation. Scientific research produces technology; extension transfers this technology to farmers; and farmers adopt the technology. Innovations are assumed to spread over the farming

community through a process of diffusion, distinguishing three adopter categories: *innovators*, *followers*, and *laggards* (Rogers 1962, 1971, 1983). The overall success of the TOT system is measured in adoption rates. Non-adoption is attributed to 'resistance to change' or the inherent conservatism of farmers. After initial successes in irrigation areas (Green Revolution), a global slow-down in technology transfer occurred. In response the Training and Visit system was developed to strengthen the training of, and intensity of interaction between, researchers and extensionists, and extension agents and innovative farmers (Benor and Harrison 1977). The T&V approach was advocated by the World Bank to revive ailing TOT systems (Bagchee 1994, Hulme 1991). The realisation that the needs of some segments of the farming community (i.e. poor dry land farmers, women) were systematically ignored, led to further refinements of the TOT system. Instead of adopter categories, target categories were distinguished (Röling 1988, 29), and extension agencies were expected to craft tailor-made packages of innovations suiting these target categories. A two-way model of the research-extension-farmer continuum was developed by Havelock (1969) stressing the need for a feedback mechanism to articulate the needs of different target categories. To strengthen their voice these target groups were organised in farmer organisations exerting 'countervailing power' on research and extension agencies (Röling 1988). Finally, on-farm research and analysis of different farming systems were used to produce more appropriate innovations that would fit existing systems of farming and be compatible with the level of inputs available (Chambers 1993, 67; with Jiggins 1987a). Neo-liberal economic adjustment policies (1990s) have reduced budgets for public research and extension services, ushering in reforms focused on cost recovery, financial autonomy, accountability and partnership (Beynon *et al.* 1998). Under the neo-liberal dispensation the TOT system is expected to transform itself into a multi-plural complex of public and privately funded agencies, agri-business firms, NGOs, farmer associations and private consulting firms that delivers services to a variety of clients with different needs (Haug 1999). Whilst large-scale commercial farmers have found their way to privately funded research and extension services, one wonders whether smallholder farmers with little political leverage or economic 'buying power' can equally benefit (Rukuni *et al.* 1998).

As alternative to market based TOT reform, the **Farmer First** paradigm emerged, comprising a host of different approaches all stressing the need for, and benefits of, farmer participation and empowerment. Farmer Participatory Research (FPR); Participatory Technology Development (PTD); Farmer First and Last (Chambers 1983, 1993, Chambers and Jiggins 1987b, Chambers *et al.* 1989) all involve a concerted effort to ensure that the farmer takes centre stage. Farmer First advocates assume the reason why farmers do not adopt innovations is not their supposed ignorance or farm-level constraints, but deficiencies in the technology and the process that generates it. To overcome these deficiencies roles have to be reversed: researchers and extensionists have to learn from farmers. Contrary to the universal character of 'scientific' knowledge and technology generated at research stations, farmer-led innovations rely on local 'indigenous' knowledge and technology development that suit the circumstances and conditions of the locality (Brokensha *et al.* 1980, Richards 1985). The approach has been promoted vigorously by aid agencies with an emphasis on the development of participatory methods and principles of farmer experimentation. To date, farmer-led extension programmes are 'rare islands in a sea of conventional programmes' (IFAD 1996). Critics of the approach have pointed at the exorbitant expense in human and financial resources that is required to make it work, the piecemeal effects produced by isolated pilot projects, and the difficulties in scaling-up successful examples (Mutimba 2003, Scoones and Thompson 1994).

During the 1990s another paradigm evolved out of the Farmer First movement. **Collective action for sustainable agriculture** approaches focus on communicative support and learning processes for collective community management of natural resources, rather than on technology transfer or adaptation. Drawing on soft systems methodology (Checkland 1981, 1989), these approaches bank on a process of shared problem appreciation amongst different stakeholders, resulting in collective action for sustainable resource use (Röling 1994, Röling and Pretty 1997). Despite notable successes in integrated pest management (Röling *et al.* 1995) and land care management (Pretty 1995) difficulties in consensus building (Leeuwis 1995) and the need for resourceful and skilled outsider facilitators have limited the impact so far.

Agritex employed a wealth of different extension methods, ranging from group extension approaches (in commodity and interest groups or through traditional work parties) to individually based approaches (see Hakutangwi 1998, 10-11). However, the main thrust during the first decade after independence was on master farmer training, confirming the belief in the master farmer model as the way of commercialising the smallholder farmer.

Standardisation and expansion of Master Farmer training

The scaling up of master farmer training involved an ongoing process of standardisation of the programme. Already in the early 1960s a master farmer 'standard' had been developed (Kennan 1980, 184). Whereas previously only high performing farmers that practised the recommended extension package had been awarded a master farmer badge,¹⁵ emphasis shifted to training aspiring master farmers in a class-room setting based on an expanding curriculum of recommended practices, contained in hand-outs and later in a master farmer training record book. The emphasis was no longer on actual demonstration in the farmer's fields, but on oral or written reproduction of taught knowledge of the correct practices. These teachings would then be practised on a small plot, comprising only a fraction of the farmer's total land holding. This plot became popularly known as the *munda wemudhomeni*, the plot of the extension worker. After two consecutive years of attending classes, and practice in the field, covering five subjects (cattle keeping, farm management, one grain crop, one cash crop, and another relevant practice like irrigation), the trainee would be examined orally by an agricultural supervisor from another district. The marks of the extension worker contained in the record book would then be averaged with the marks of the oral exam, and the ultimate score determined whether the award of a certificate and badge was justified. The provincial specialist for MFT did the ultimate pass or fail judgement, in order to prevent fraud cases by over-zealous extension workers (Agritex 1990). Over time subjects were added to the curriculum, the most notable being farm and crop budgeting in the late 1980s, stressing the need to commercialise smallholder farming. In 1981 advanced master farmer training was started in order to train a new generation of literate sons and daughters of small-scale commercial farmers (Van der Veen 1982). The programme was later expanded into resettlement and communal areas to cater for a vanguard of commercially oriented master farmers. Exams are done in writing and the emphasis of the curriculum is on cash cropping and other commercial farming ventures (Agritex 1990).

All these developments combined led to a sharp increase in the number of master farmers. Whereas 40,000 master farmers had graduated before 1980, 44,200 ordinary master farmers and 8,500 advanced master farmers graduated in the period 1981-1994 (Agritex 1994b). Master farmer training got a new policy impetus in the early 1990s, when the blame for low productivity levels in resettlement schemes was partly put on the agricultural inexperience of the initial beneficiaries, i.e. refugees, war veterans and landless households from over-populated communal areas (Kinsey *et al.* 1998, Moyo 1995). The National Land Policy of 1991 stressed that new settlers for resettlement had to be either master farmers or trained agriculturists (Harts-Broekhuis and Huisman 2001, 287).

¹⁵ As shown in chapter 2, it was believed that farm improvement consisted of a natural process of evolution along the lines of follower - cooperator - master farmer. This made it relatively easy to pick the master farmers and formalise their status by awarding them a badge. For instance, demonstrator Kondo recalled how in the 1950s a visiting Land Development Officer on his way to a field day noticed a woman crossing the road, carrying rich manure in a basket on her head. He stopped to quiz the woman on the manure. When he discovered she was an outstanding producer, she was awarded the master farmer badge the same day.

Crisis in extension: criticism

Agritex has drawn a good deal of criticism from various quarters, mainly to do with the observed continuities with the despised technocratic approach developed during the 1950s (Alexander 1994, Drinkwater 1989, 1991). Its response to criticism from outsiders on the lack of participatory approaches (Scoones and Cousins 1989, Hagmann *et al.* 1995) has been a steady absorption of new approaches, adjustment of in-service training programmes, and a stream of (donor funded) experiments. Still, the government appointed Land Tenure Commission of 1994, chaired by a senior UZ professor in agricultural economics and extension (Rukuni), noted that:

'Today, however, farmers are extremely unhappy about the performance of all major institutions, particularly research, extension and credit. The Commission was indeed shocked to find that the whole country and all (...) farming sectors believe these lay institutions to be almost irrelevant to their situation.' (GoZ 1994, 137)

The Land Tenure Commission had not been the first to observe that the TOT model was not delivering the desired change of commercialising the smallholder farming sector. Initial attempts to improve the performance of the TOT system focused on conventional solutions, such as those outlined in box 3.1. A 1987 World Bank funded experiment with the introduction of the Training and Visit system in Midlands province floundered on its inflexibility to respond to the needs of smallholder farmers and its heavy demand on stationary and mileage, which rendered the system unsustainable (Madondo 1992, 46; Pazvakavambwa 1994, 106). Research undertaken by DR&SS was found to be irrelevant to the situation of smallholder farmers operating in the country's marginal farming regions, chiefly due to two Rhodesian legacies. DR&SS' research efforts were biased to high-input, commodity specific agricultural production in the well-watered regions of the country, i.e. 80% of its professional staff operated in Natural Region 2 (Madondo 1992, 29; Rukuni *et al.* 1998, 1078). Furthermore, no formal linkages existed between farmers, extension and research institutes, resulting in a lack of articulation of smallholder farming problems requiring research, and a lack of dissemination of innovations from research stations to the farming community. To redress the situation DR&SS established a Farming Systems Research Unit trying to take the research station, the majority of which were located in Natural Regions 2 and 3, to the farmers' field focusing on production constraints of small grain crops¹⁶ (Tawonezvi 1994, 99). In 1986 the Committee for on-farm research and extension (COFRE) formed the first formal link between DR&SS and Agritex, aiming to undertake joint trials and demonstrations in communal areas and disseminate results (Madondo 1992, 59; Shumba *et al.* 1990). Lack of administrative and financial back-up, and wrangles over the exact contents of the trials and kind of smallholder problems that needed to be addressed, soon rendered COFRE ineffective (Madondo 1992, 60; Pazvakavambwa 1994, 109; Shumba 1990, 22). On-farm trials were found to be expensive to run, and consequently the first to be scrapped in the face of dwindling public resources (Fenner 1990, 47). Attempts to take farmers' practices into research stations met with some success on conservation tillage in Makoholi research station, located in Natural Region 4 (Chuma and Hagmann 1995), and on agronomic practices in low-rainfall areas in Chiredzi Research station in Natural Region 5 (Nyamudeza 1999). However, the research findings thus produced¹⁷ ran counter to the mixed-farming model propagated by Agritex, and were discarded.

¹⁶ Small grain crops are millets and sorghums, suitable for semi-arid conditions.

¹⁷ Research on conservation tillage demonstrated the benefits of zero-tillage and use of 'inverted' contour ridges in low rainfall regions, running counter to the Alvord axioms of winter-ploughing and construction of contour ridges to drain excess rainwater. Research on maize growing in the semi-arid natural region 5 ran counter to prevalent conceptions on semi-arid areas being only suitable for cattle ranching.

The adoption of structural adjustment policies in the early 1990s further crippled the effectiveness of the TOT system through staff retrenchments and cuts on operating expenses.¹⁸ The liberalisation policy increased the role of transnational agro-chemical and seed producing companies, like Ciba-Geigy, Bayer, Cargill and Pioneer, in producing and releasing new short season, drought tolerant varieties in maize, cotton and other commercial crops (Bolding *et al.* 2003, Worby 2001). However, little attention was paid to millets and sorghums by these companies, fuelling fears on the lack of voice of smallholders in directing the research agenda (Rukuni *et al.* 1998).

Thus after a decade of rise in staff numbers, entrusted tasks and professional standards, Agritex found itself on the road to demise. Despite a change in its mission statement, stressing the need for 'exchange and sharing of knowledge, skills and ideas between the farmer and the extension agent' (Agritex 1993), Agritex started to draw fire from within its own ranks. The Chief Agricultural Extension Officer for Manicaland Province presented a devastating critique at the annual staff conference in 1993. He observed that the mission to commercialise the smallholder farmer, which amounted to nothing more than an attempt to imitate the European large scale commercial farmer at a smaller scale, had failed. The emphasis on the promotion of high-input, high yielding varieties in monocultures had alienated the department from the reality of smallholder farming:

'We closed our eyes to the practices and systems practised by the majority of farmers in the sector. The role of mixed cropping and its effects in the promotion of sustainable agriculture never dawned on the department.' (Madondo 1993, 2)

He further lamented the 'gradual deterioration in staff ethics' manifested by a growing indifference to work and cases of outright arrogance, and a lack of commitment to 'liberate the farmer from our control' (Ibid., 5). Regarding the main vehicle to commercialise the smallholder farmer, the master farmer training programme, Madondo observed it had become an high input - low output approach, surviving on 'political clout' within the department, whilst having the unique characteristic of 'entrenching dependency' of master farmers on their extension agent (Ibid., 4). How exactly this process worked in Chimanimani district is the subject of the rest of this chapter.

3.3 THE PERFORMANCE OF MASTER FARMER TRAINING IN CHIMANIMANI DISTRICT

By the mid-1990s Agritex' representation in Chimanimani district consisted of 24 extension workers, three supervisors, five officers plus some supporting staff (office orderlies, clerks and general hands). These operated from four main offices located in Chimanimani proper (responsible for the district as a whole), Nyanyadzi (irrigation), Bumba (Shinja resettlement scheme) and Cashel (cooperative resettlement schemes and commercial farms in the North East of the district). In addition, extension workers serviced their communal area wards from their own homes. Recent budgetary cuts had crippled Agritex' operational span in Chimanimani, reflected in several posts remaining vacant and departmental transport facilities being reduced to nil.¹⁹ Below the actual performance of master farmer training in

¹⁸ The real budget for DR&SS declined by 33% in the period 1980-1994 and continued to dwindle after that (Rukuni *et al.* 1998, 1078). Agritex faced similar budget cuts. By the end of the 1990s DR&SS research stations could only operate for 2-3 months into the financial year, after which the stations were closed down. Expenditure on staff salaries took up 80-90% of the total budget for both Agritex and DR&SS (Madondo 1992).

¹⁹ Three officers used private cars during working hours. The rest of the staff depended for moving around on public transport, lifts from government vehicles of other departments, or, most commonly, their own feet .

Nyanyadzi catchment area is presented. First, attention is paid to the actual spread of master farmers across the district and the rise of in-house criticism against some of the programme's modalities.

Virtual master farmers: office routines and local criticism

As part of a national evaluation of the master farmer training programme, the provincial Agritex office requested the Chimanimani office in early 1995 for an overview of trends in MFT, annual intake of trainees, and gender division amongst trainees and graduated master farmers.

As with all incoming requests for data the DAEO delegated the task to the extension worker, responsible for land use planning and coordination of the MFT programme. Unfortunately the organisation of the files on MFT was messy and incomplete. Ultimately the extension worker sat down behind his desk and started producing figures from the top of his head. The result was an impressive list (list A), comprising thousands of trainees, the majority female. Since the majority of active farmers in the field were female, the extension worker considered that the sex ratio of trainees ought to reflect this. After seeing the figures the DAEO realised they wouldn't be acceptable to the Provincial office, where records were kept of the annual number of certificates issued to each district. The DAEO asked the office draughtsman to have another look at the figures.

The draughtsman started in the same way as the previous compiler: behind his desk, with frowns in his face. He produced list B, containing more trainees and advanced trainees. Next, the Provincial Office indicated it needed data on examined trainees and their pass rates too. The MFT specialist sent pre-printed forms in January 1996, indicating the data were requested by Head Office before April, 30, 1996. A new extension worker looked at the request and produced a list (C) containing 53 master farmers trained before 1980, running up to a cumulative total of 405 certified master farmers in 1994 (236 men and 169 women). Again the DAEO was suspicious, requesting the draughtsman to have a final look at it. The latter once more inflated the total numbers (906 by 1994), and reversed the sex ratio (210 men and 706 women). By the time list D was ready to be sent off, the request was again modified by the Provincial office: the number of ordinary farmers also had to be included, listed according to village and ward. This list (E) was handed in on 26 April 1996.

The Province suspected a fraud and sent another request in May, insisting that the data be collected from the responsible extension workers themselves. In an accompanying note the Provincial specialist noted that Chimanimani district had produced nil master farmers in 1995. By now the district staged a large scale operation. Its urgency became frantic after it transpired that the second in charge of Manicaland Province had written a letter to the director apologising for the failure to submit data on master farmer trends in Manicaland, due to delays in Chimanimani district. Finally, on 16 June 1996, a definite list (F) was sent off, based on data provided by extension workers (see table 3.2). The table shows that master farmers comprised an elite amongst smallholder farmers (2.3%). Despite the changing discourse within Agritex on the dominance of women in the farming sector, female master farmers made up only one third of the total. The concentration of master farmers in resettlement and irrigation schemes confirms the thrust of agricultural modernisation in the district (see 1.4). The official requirement of master farmer settlers in either irrigation or resettlement schemes is reflected in their number, though a vast majority of settlers does not fulfil this requirement.

Table 3.2: Ordinary farmers and (advanced) master farmers in Chimanimani district

Area	Ord. farmer		Total	Master farmer		Advanced MF		Total	% MF & AMF
	Male	Female		Male	Female	Male	Female		
Communal	9038	4814	14113	112	83	0	0	195	1.4 %
Resettlement ²⁰	228	39	347	65	15	0	0	80	23.1 %
Irrigation ²¹	453	118	571	46	16	3	1	66	11.6 %
Totals	9719	4971	15031	223	114	3	1	341 ²²	2.3 %
(%)	64.7%	35.3%	100%	65.4%	33.4%	0.9%	0.3%	100%	

Source: Agritex Chimanimani District, June 1996

Table 3.3 shows the spread of master farmers over Chimanimani's natural farming regions. Despite the uniform propagation of the master farmer model and its mixed farming practices, irrigation areas and mixed, semi-intensive farming areas (NR 3) are heavily over-represented, whilst master farmers in the wet specialised (NR 1) and dry extensive farming areas (NR 5) show slight to heavy under-representation. Thus the agro-ecological bias of the master farmer model is more or less confirmed on the ground. The agricultural practices contained in the model do not suit densely populated, good rainfall areas in hilly conditions, neither do they provide for viable farming in dry areas, where only a combination of cattle ranching and labour migration can produce an income.

Table 3.3: Spread of master farmers over Natural Regions, Chimanimani district

Natural Region	# farmers	spread over NRs (%)	# MFs	spread over NRs (%)	Over- or under representation of MF
Irrigation ²³	633	4.2 %	66	19.4 %	+ 15.2 %
NR 1	4171	27.7 %	77	22.6 %	- 5.1 %
NR 2b	519	3.5 %	19	5.6 %	+ 2.1 %
NR 3	2697	17.9 %	116	34.0 %	+ 16.1 %
NR 4	1867	12.4 %	47	13.8 %	+ 1.4 %
NR 5	5144	34.2 %	16	4.7 %	- 19.5 %
Totals	15031		341		

Source: Based on Agritex Chimanimani District files, June 1996

In early 1994 the senior supervisor responsible for the administration of the programme at district level retired without replacement, as part of the World Bank financed reforms of the civil service (read, retrenchments). This created great disaffection with the programme, precipitating its demise in Chimanimani and other districts. The number of trainees dropped after 1993 (table 3.4). Officers and extension workers complained that the programme has received little back up since. Results of Master Farmer tests taken in 1993 and 1994 were not announced by the Provincial office, and by 1995 no more trainees were tested in

²⁰ Only officially resettled farmers have been included. If we add squatters the number would rise with a factor 3 to 4.

²¹ Only the official government irrigation schemes were included (i.e. Nyanyadzi, Chakohwa and Nenohwe). If we would add Mutambara irrigation scheme and the numerous farmer initiated irrigation furrows spread over Umvumvumu, Nyanyadzi, Umsapa and Rusitu catchments the percentage of irrigating master farmers would be more disproportionate. There is a strong correlation between ownership of a master farmer certificate and access to irrigation water (see 3.5). Equally it should be noted that the figures on ordinary farmers on the official schemes consider only official plot holders. In practice many more farmers stay on the plots (see chapter 7).

²² If we include the resettlement areas without Agritex extension workers (no returns in June 1996), the total number of master farmers in Chimanimani district is probably around 400.

²³ Irrigated areas are taken as separate natural regions, since they supposedly create favourable farming conditions by the controlled supply of the critical farming resource, water.

Chimanimani. The training curriculum for the 1995 season was not sent and trainee booklets arrived either late or in insufficient numbers. Moreover the prized master farmer badges were no longer freely supplied by a cash strapped Agritex department.²⁴

Table 3.4: Trends in master farmer training, Chimanimani district, 1987-1996

Year	MFTs tested			MF graduated			Cumulative totals		
	Male	Female	total	Male	Female	Total	Male	Female	Total
1980									53
1986							83	46	129
1987	35	27	62	29	25	54	112	71	183
1988	33	24	57	26	19	45	138	90	228
1989	41	26	67	22	18	40	160	108	268
1990	25	15	40	16	11	27	176	119	295
1991	17	11	28	12	8	20	188	127	315
1992	39	27	66	35	23	58	223	150	373
1993	17	15	32	No results					n.a
1994	(13)	(9)	(22)	No results					n.a
1995	0	0	0	0	0	0			n.a
1996	7	6	13	Results not known					n.a

Source: Agritex Manicaland Provincial master farmer register and own observations

The disaffection of Agritex staff with the programme was not just caused by the lack of administrative back up experienced. It was as much informed by a critical assessment of the programme by officers looking for interesting material for their conference papers and Bachelor theses. Madondo (1993) with his critical remarks on the programme had opened a hunting ground that was soon crawling with hunters from within all levels of the organisation. An assessment of the quality of master farmers in Masvingo province considered the majority of graduates 'below standard' and a 'disgrace to the Department':

'There is no way that an extension worker can dream of using the farmer with the above results to assist in agricultural extension' (Maposa 1994, 16)

The specialist on MFT and other top officers in Manicaland Province (Tapererwa and Chivizhe 1994) aired the same feelings. Master farmers could not possibly serve as an example to peer farmers, since their performance was at par with non-master farmers, except for a group of experienced master farmers who had benefited from pre-independence practical training (ibid, 10). The low quality of master farmers was assumed to explain their numerical scarcity in communal areas. The syllabus was considered inflexible, full of blanket recommendations that had not been verified by scientific research, and heedless to specific agro-ecological circumstances or farm specialisation (e.g. dairy or irrigated farming).^x Officers in Chimanimani district lamented the lack of back up and flexibility:

*'You know the training branch is full of technocrats. We can't discuss things with them. What we need is flexibility in the program, but those technocrats are not flexible. So what we do is, we change it in our own ways and report as if everything is done according to plan.'*²⁵

The reporting 'as if everything is done according to plan' proved contagious amongst Chimanimani field staff. Each extension worker dutifully reported the existence of virtual master farmer trainees in his/her area. When talking of inflexibility, the DAEO had maybe the rigid spot-check at the ARDA Rusitu dairy scheme in mind. A provincial Agritex team

²⁴ The Chief Training Officer sent a begging letter to his Director and the president of the Zimbabwe Farmers Union, listing the annual expenditure for providing the badges (letter dd 30 March 1994, Agritex Manicaland files).

had threatened to withdraw certificates from master farmers on the scheme, since they did not maintain a cattle kraal and feeding rack. The ARDA estate manager went at great lengths to explain that those items were irrelevant in their dairy scheme, since they worked with zero grazing units and feed throughs.^{xii} Furthermore officers in Chimanimani felt that master farmers tended to create 'their own demands. They do not want to listen anymore, but demand specific services.'^{xiii}

Performance of master farmer training in Nyanyadzi catchment, 1994-97

Unaware of the phenomenon of virtual master farmer training in Chimanimani, I set out to interview each extension worker in Nyanyadzi catchment on their training groups. I was frequently met by inquisitive looks and probes on my status as researcher, before being told that master farmer training was a non-starter for various reasons, lack of administrative back up being the foremost. Other reasons for discontinuing training were transfer of the trainer before completion of the two year course, lack of motivation amongst farmers due to previous graduates receiving no results, and inappropriateness of the training curriculum to the farming conditions in the area (see table 3.5).

Ultimately I decided to follow master farmer training by two different extension workers, one experienced and one young, in two different settings, comparing differences in style of training and response within the community. Below two training sessions are analysed, after a brief introduction to the area and extension worker concerned.

Table 3.5: Master Farmer Training in Nyanyadzi catchment, 1994-97

Ward	AEW's Area (nat region)	#groups; Trainees (yr)	Reasons stopped	Exams (yr)
Nyanyadzi	dryland (5)	-	MFT unsuitable for NR 5	-
	block B	-	sons of MFs; nothing new to learn	-
	blocks C&D	2; 27 (94)	AEW transferred (96)	-
	block A	-	sons of MFs; MFT unsuitable for irrigation	-
Rupise	Nenohwe irr	1; 16 (95)	AEW transferred (97)	-
Chayamiti	old AEW (4)	1; ? (94)	AEW transferred (96)	-
	new AEW(4)	1; 34 (96)	-	-
Shinja Com	(3-4)	1; 8 (94)	4 exams (93), results unknown	3 (95) ²⁵
Shinja Res	Vill 6-12 (3)	6; 102 (95)	2 passed exam (93), no badge	3 (96)
Biriwiri	(2-3)	-	2 groups exam (93), no results	-
Mhakwe	(3)	-	1 group exam (93), no results	-
Chikwakwa	no AEW (94)	-	-	-

Source: Interviews with Agricultural Extension Workers (AEW) by author

Master farmer training by an experienced extension worker in Shinja communal area

Tembani is a friendly, senior extension worker with 24 years of experience in the district. His career covered work on conservation and irrigation in the low veld around Nyanyadzi (1970-78), on the organisation of Young Farmers Clubs throughout the district (1978-1984), and again on irrigation and dry land farming in Mutambara communal area. He grew up on his father's small-scale commercial farm near Rusape,²⁶ an experience which imbued him with a sense of pride in agriculture. As an adolescent Tembani dreamed of becoming a teacher, but his father, a competition winning master farmer, persuaded him to opt for agricultural

²⁵ These candidates from Shinja communal area failed to be tested in 1995, since exams were not organised that year in Chimanimani (no supervisor found prepared to take the oral exams).

²⁶ Tembani's grand-father got the farm as part of a retirement package after soldiering for Southern Rhodesia in two World Wars.

extension worker. The job helped Tembani to pay for the school fees of his own ten children and those of his younger brothers and sister, besides providing occasional cash injections to his father's farm.

Since 1986 Tembani has been operating in Shinja Ward, a drought stricken area with little agricultural potential (situated mostly in Natural Region 4). At the time of our meeting Tembani was getting frustrated with the lack of pace in his career. He felt his experience should have landed him the post of agricultural supervisor.²⁷ After the breakdown of his motorbike, he did his rounds through the five villages of Shinja by foot, covering one village every weekday. Tembani spent the weekends with his wife, who runs a small tuck-shop near Wengezi in Chimanimani district. The 502 farming households in the area mainly grow maize, sorghum and *mhunga* (bulrush millet), whilst relying on labour migration remittances to pay for school fees. Tembani discouraged the growing of maize, a risky crop in this area, since it fails every other year for lack of rain. Many people relied on drought relief handouts after loosing most of their livestock in the 1991-92 drought. Tembani took pride in his extension projects that ranged from establishment of an irrigated garden and fishpond at the local school, to encouragement of poultry keeping, and cultivation of cash crops like sunflower and cotton. The latter caused a small-scale 'agricultural revolution' in Shinja. The number of registered cotton growers in the area rose from nil in 1986, to a peak of 45 growers in 1991. After that their number slumped to six in 1994, a trend that Tembani attributed to changes effected by the Cotton Marketing Board. The Board abolished group registration and issuing loans in favour of individual registration and loan provision in Mutare, at 125 kilometres from Shinja. Other sources of pride for Tembani are the hosting of an annual agricultural show, vigorously supported by the local councillor and self-proclaimed headman of the area, and his efforts to train master farmers, of which there were only two in the area.

In 1993, four of his trainees sat for their exams, the results of which were not yet known by the time I joined Tembani and his group of eight trainees for their class (May 1994). The setting comprised a room with school benches at the local health clinic, adjacent to Tembani's house, in Shinja Business Centre. The five male and three female trainees were seated separate from each other on benches, whilst a graduated master farmer and his father sat next to Tembani and me on low wooden chairs. The master farmer intended to do the advanced master farmer course for which he received a trainee record book. Tembani opened the session by relating today's programme, as dictated by the training calendar. The topics of this week's lesson were (a) the aims of cattle keeping, (b) dosing of cattle against common diseases; (c) conservation of arable lands; (d) plant spacing; and (e) spraying of vegetables. Tembani took the participants through the contents of the lesson with the air of a schoolmaster. On each topic he solicited the opinion of his audience and jotted their comments on a small blackboard. After listing their comments, sometimes probing the shy female trainees for an answer, he provided the correct answers, which were duly noted by the trainees in their notebooks. Tembani brought samples of the chemicals he recommended for spraying, the dosing of which he demonstrated by using common household utensils (half litre bottle of cooking oil, 5 ml spoon for gripe water). Of the common diseases affecting cattle, e.g. round worms and ascaris, he had brought specimen samples in tiny bottles containing alcohol.

After two hours of training, Tembani took the group outside to have a look at the village demonstration plot on the benefits of zero-tillage. He pointed at the crop spacing applied, rich

²⁷ In 2000, Tembani finally got his promotion after six years of fruitless interviews for the post.

mulch of maize stalks and the distance between the small contour ridges. An older trainee commented that they used to practice zero tillage in this area, according to their own traditional methods (called *hawira*). Tembani smiled. Later he confided in me that despite zero-tillage not being recommended by the department, he decided to give it a try after reading a booklet by Oldrieve (1993) on the benefits of zero-tillage in semi-arid areas. After dismissing the class, Tembani and me joined the master farmer and his father to have a look at his irrigated land, situated along Nyanyadzi river. It was obvious this was Tembani's favourite farmer, growing a cotton and sunflower crop on his disproportionately large land holding of 25 hectares, of which 4 hectares were irrigated by a self-dug furrow.

Master farmer training by a young extension worker in Shinja resettlement area

Nyagwande is a young extension worker, gifted with an aura of hard work and much loved by his farmers for his accessibility and preparedness to help.²⁸ A son of a retired National Parks ranger who settled on a resettlement farm in Nyanga, he was the best of his class at the Agricultural College, before joining Agritex in 1989. After a short stint at Mutambara irrigation scheme, forming 12 successful tomato growers clubs (see Manzungu 1999), Nyagwande was posted at the local Agritex office in Shinja resettlement scheme in 1992. Covering a wide area comprising six model A resettlement villages in natural regions 2 and 3, Nyagwande is always on the move, either by foot, by bus or by using lifts from local traffic.

In 1995 he was running six MFT groups (102 trainees), one in each village, whilst at the same time becoming its most vociferous critic. At the Agritex district staff conference in February 1995 he lambasted the MFT programme for sticking rigidly to its curriculum without considering farmers' problems, stimulating the teaching of bookish knowledge without drawing on farmers' knowledge, and for failing to adjust the training content on the basis of regular evaluations. The sudden surge in MFT in Shinja resettlement scheme had in his opinion little to do with the supposed high performance of Master Farmers, but more to do with ongoing debates in resettlement offices on the need to select for future resettlement a more productive and well-endowed type of farmer (i.e. master farmers possessing livestock and farm implements).

In July 1995 I joined Nyagwande during one of his training sessions in village 12, situated along the Nyanyadzi river (see map 9.4). The village is a model A resettlement village in natural region 3, comprising 42 official settlers with one hectare of arable land and five hectares of communal grazing land each. The villagers were engaged in a fencing project, constructing paddocks in their grazing area, which had been invaded by squatters buying land from a local headman. Of the 24 master farmer trainees (6 women, 18 men) 13 had access to irrigated land serviced by one of the seven irrigation furrows in the village. The main dry land crops are maize, *mhunga*, cotton, peanuts and sunflower. In the irrigated plots wheat is grown for home consumption, whilst for cash, tomatoes, peas and beans are grown under contract for two Mutare based agri-business companies.

The training session was held in the midst of winter at the village training shed that had recently been constructed by the villagers. Chiambiro, the VIDCO chairman who also happened to be master farmer, secretary to the farmers' cooperative and one of the two leading irrigation farmers in the village, opened the session. After being invited, Nyagwande took over with a typical Agritex slogan, raising his hand, shouting *Pamberi nekurima! Pasi*

²⁸ In 2000 he was crowned national extension worker of the year. Thereafter he was promoted to the post of supervisor.

nenzara! (Forward with farming! Down with hunger!). Thereafter Nyagwande handed out gum tree seeds, which had been supplied to him by the Forestry Commission, to establish homestead woodlots. Chiambiro explained from his own experience how to plant the seeds and replied questions from the attendants. Next Nyagwande put a paper sheet on a tree, indicating that today's lesson began.

Nyagwande teaches in an interactive fashion, by putting questions to his audience and inviting attending (master) farmers to relate their experiences. The training session thus took the appearance of a group discussion with Nyagwande acting as its moderator. He only intervenes when he feels an issue requires more debate or factual information to highlight a different angle of the problem at hand. Today's subjects cover (a) the use of chemicals, (b) winter ploughing, and (c) planning of the cropping season that lies ahead. Approximately one hour of debate is spent on each topic. At no stage during the session does Nyagwande succumb to the common extension officer practice of holding monologues on what is supposed to be done.²⁹ He starts each subject with inquisitive questions to his audience, listing their answers and then having several farmers verify the agreed methods by recounting their own experiences. Nyagwande does not shy away from acknowledging common agricultural practices that are not recognised in the MFT curriculum. For instance, after showing some samples of insecticides, a woman asks Nyagwande which chemical should be used against red spider mite. Nyagwande bounces the question back to her. Timidly, the woman recounts that 'we use traditional medicine (*muti*).' Nyagwande smiles, and tells that he himself at times uses 'the legs of pumpkins, or the juice of haired fruits'. This remark is met with a thundering applause. Next, Nyagwande suggests rogor (the recommended insecticide) may also be used. His point is to alternate between different detergents, since the red spider mite tends to become resistant after continued exposure to the same insecticide. As the session draws on, Nyagwande starts to crack jokes to keep up the level of attention. After finding out that only two senior master farmers, out of the 37 attending farmers, own knapsack sprayers (recommended for spraying of chemical substances), Nyagwande remarks that's like adding a teaspoon of sugar to a whole drum of tea (general laughter). Asking what to do when it starts raining, a man replies: take shelter. Nyagwande silences the ensuing laughter by advising the man to buy a raincoat: 'Your field is your business! I'll give marks for those of you who practise winter ploughing this season.' Nyagwande takes the mission of commercialisation of farming serious. He takes time to announce the (government) prices for all crops this year and converts them into payouts per bag. He wants all trainees to make a crop budget for the coming season, using those figures. At the end of the session he recapitulates the main points of today's lessons, and announces on which issues he is going to monitor the trainees in their fields (i.e. mark them in their trainee record books). He closes by taking questions on the session. Various representatives make announcements, and a senior master farmer closes the meeting with a prayer.

Comparing these two cases of master farmer training in action, a number of observations can be made. Both training sessions involved an intense interaction between the extension agent and the trainees on the pros and cons of specific farming practices. In that sense the MFT programme constitutes one of the most intensive forms of knowledge exchange available to Agritex, and could indeed be one of its main vehicles for mutual learning. The way MFT is conducted depends on the personal qualities and skills of the trainer as well as his opinion on the programme. These personal features together result in a particular style of training.

²⁹ Such speech acts, denouncing lazy farmers and cherishing productive farmers, are often performed at field days and agricultural shows by dignitaries eager to celebrate progress, in the process legitimising state development initiatives.

Whereas Tembani's style is that of the school teacher he always aspired to be, Nyagwande's style comes close to that of a facilitator, as envisaged in Agritex' new philosophy of extension. Both trainers try to overcome the inflexibility and supposed irrelevance of the MFT curriculum, by adding new elements to the training based on farmers' own experiences. But where Tembani insists on verifying common farming practices (i.e. zero-tillage) by means of demonstration trials, Nyagwande takes these practices (i.e. use of traditional *muti*) at face value, adding them to the basket of options available to the farmer in the field. However, the proof of the pudding is in the eating. In this case the final scoring and theoretical exam constitute the mettle that makes or breaks an aspiring master farmer.

Master farmer exams: translating fuzzy practices into an ideal mode of ordering

I was quite fortunate to witness the final examination of three master farmer trainees in September 1996, as it turned out these were the only exams taken during my stay in Nyanyadzi catchment area.³⁰ The exam concerned three experienced master farmer trainees in Shinja resettlement scheme, who had been tested before in 1993, but whose results had subsequently got lost in the myriad of drawers, files and dust bins found in Agritex' offices.

These three were by no means average farmers in the resettlement scheme. They shared the possession of large land holdings on rich alluvial soils, above average livestock holdings (varying from 8 to 21 heads), access to irrigated land (varying in size from 0.1 to 1 hectare), private woodlots and lush orchards, and homesteads consisting of brick houses of rectangular shape. Their influence stretched beyond their fields: one of them owned a car and a shop and another was the VIDCO chairman in the area. All were practising members of the Methodist church. Their examiner was an experienced supervisor, Rwambiwa, who was new in the area, and therefore qualified to take the exam.³¹

The actual procedure of the exam consisted of Rwambiwa visiting the trainees, inspecting their land, irrigated gardens, cattle kraal, woodlot and homestead. During the inspection Rwambiwa would ask questions on certain things he saw and give tips on how to improve. In all three cases we went round with the husband of the house.³² During the inspection round Rwambiwa would mark scores in the MFT record book. The exam ended with a theoretical quiz, consisting of eight questions, which again would be scored by Rwambiwa. After that Rwambiwa would pass his judgement, telling the trainee which improvements still had to be made before he could sent their record books to the Provincial office for vetting. At some stage Rwambiwa related to me that in spite of the ordeal these aspiring master farmers faced, by having to go through the same exam again, he felt he had to be tough on them to make sure 'we have only master farmers up to the required standards.' The marking procedure, structured by the record book, and importance of the occasion, as reflected in the docile behaviour of the trainees towards their examiner, helped to instil this sense of strictness. The result was the enactment of the material, symbolic and social modes of ordering mirrored in the blanket recommendations contained in the trainee record book. Any aberration on the

³⁰ The bulk of trainees in Shinja resettlement area were not yet ready for exams, since their trainer (Nyagwande) had had difficulties to get them through two years of sessions, consisting of 24 days of training each year.

³¹ Normally the extension supervisor of the area is not allowed to be the final examiner. In this case, prejudice was thought to be minimal, since the supervisor was unfamiliar with both the extension worker and the examined trainees.

³² After probing by me, Rwambiwa admitted that the master farmer certificate should be issued to both husband and wife, since the latter did most of the actual agricultural work. He legitimised his sole focus on the husband, by paying less attention to typical women's jobs like post-harvest treatment of the crop and keeping of the homestead.

standards was noted by Rwambiwa and commented on disapprovingly. Storm drains were found to be narrower than the recommended 3 metres width, maize stover left on the field was disapproved, and sensible innovations in the set up of a cattle kraal or containment of soil erosion on steep land resulted in a lower score.³³

The theoretical quiz at the end of the field inspection amounted to the trainee having to reproduce blanket recommendations on correct row and in-line spacing distances for maize, kind and amount of fertiliser required for maize and sunflower, dipping chemicals required for cattle, and purpose of keeping farm records. Several months after the examination, the three aspiring master farmers were still busy implementing the recommended improvements. Meanwhile Rwambiwa had kept their record books on hold, proposing to send them on to the provincial office after a final inspection at the end of the growing season.

The model Master Farmer as a mode of ordering

The above shows that the model of the master farmer forms not only a material and social mode of ordering smallholder farming practices in the field, but equally forms an administrative mode of ordering for extension agents in their business of commercialising and thus transforming the community of smallholder farmers. Thus, whilst hardly any MFT was going on in Chimanimani district, extension officers and workers alike report as if it is being executed according to plan. The much craved for flexibility in the programme, deemed necessary to pay tribute to a variety of agro-ecological settings and innovative farmers' practices to deal with these and other (socio-economic) differences, is performed during the training stage, but undone by the administrative procedures besetting examination. The on-going standardisation of the execution and curriculum of the MFT programme has resulted in the programme degenerating into a fossilised package of farming standards, separating the 'heroes of progress' from the masses of 'lazy farmers'. The next section will delve further into this business of heroes and losers by examining the role of extension agents and master farmers in the performance of yet another modernising tool at the disposal of the extension service: field days. In the remainder of the chapter master farmers themselves feature prominently focusing on the use they make of the programme to enhance their status and access to state mediated resources.

3.4 ASSESSING EXTENSION WORKERS PERFORMANCE: FIELD DAYS AND MASTER FARMERS

Field days and agricultural shows at area, district, province and national level have a long history in Zimbabwe, dating back to the days of Alvord. Originally these public events were supposed to instil a sense of competition in the farming community. By means of the celebration of agricultural success, demonstrated in the fields and quality and quantity of displayed farm products, it was hoped to induce less successful farmers to copy or mimic prize winning master farmers. Alvord not only used these occasions to accolade the heroes of progress and demonstrate the inherent qualities of the master farmer improvement package, but also to evaluate the performance of the originator of the success, the extension agent. Failure to host a successful field day often precipitated discharge or transfer of the

³³ Two of the three trainees made use of bench terraces to contain soil erosion on steep land. Construction of bench terraces is widely practised in the area (see Van der Zaag 2003), allowing cultivation of land that cannot be protected by means of the fashionable contour ridge. The principle of protection is however reversed. Instead of getting rid of excess rainwater by means of storm drains, the force of water flowing over arable land is used to depose silt behind stone walls, thus creating terraces breaking the speed of the descending water. Rwambiwa, failed to appreciate this practice by insisting on the construction of storm drains along the top of the fields.

responsible demonstrator. Thus extension agents were impelled to focus their attention on resource-rich farmers capable of producing success. Whilst the risk of being fired was minimal in post-independence Zimbabwe, most extension staff in Chimanimani still valued the hosting of a successful field day and well attended agricultural show. Below a typical field day and its advanced master farmer host is presented to demonstrate the ritual character of such events in Chimanimani. Thereafter it is discussed to what extent master farmers and extension agents use field days and farming competitions to foster their common plight for commercialised agriculture. Finally, the role field days and agricultural shows play in legitimising state intervention is discussed.

The ritual performance of field days: Kenya Dube and the 1995 season

To Kenya Dube, advanced master farmer in Nyanyadzi irrigation scheme, 1995 represented a good agricultural year. He not only hosted the CARGILL maize field day, reaping free seed and fertiliser in the process, but also won a hat at the ensuing maize field day organised by competing seed house SEEDCO. During the AGRI-SEEDS beans field day in June he won a bag of beans seed for finishing third in the local farmers' competition, and finally during the ZFU district show he won 2 bags of fertiliser for coming second best farmer of the district. This came as no surprise to the Nyanyadzi community where Kenya is a well-known public figure both as water *bailiff* and as one of their best farmers, a quality he is alleged to have inherited from his mother (see box 3.3). Kenya's fields are always well watered and his yields are at par with those attained by large-scale commercial farmers.

For Lydia, the extension worker operating in block A, Kenya is a sure bet for hosting a successful field day or testing a new crop variety. The year was a success to her too, hosting three well-attended field days in her working area, whilst her two colleagues in the Nyanyadzi office hosted none. Lydia had skilfully bargained with the two competing seed companies to sponsor a field day as a way to promote their products. Equally, she had pressed the company signing the green beans contract for the winter season to sponsor a field day as a means to create good-will amongst the irrigators, thus minimising the risk of side-marketing.³⁴ The sponsorship in all three cases entailed the provision of free food, beverages and prizes, thus turning the event into a feast for both officials and farmers. It is for this reason that field days are often referred to by farmers as 'feed days'.

The three field days in Nyanyadzi all proceeded along a fixed refrain of events, as if performing an age-old ritual. Around ten o'clock in the morning people start to converge under the big fig tree in front of the local Agritex office. Local and visiting government officials are seated on benches next to the Irrigation Management Committee members facing the tree. The local traditional leadership, councillor and other prominent members of the community (businessmen) occupy the benches under the big tree. Seated on the ground are the masses of Nyanyadzi farmers, women separate from the men. In the centre of the meeting ground, crates of soft drinks have been piled up. During a rather longish opening session all dignitaries are introduced in descending order of importance. When mentioned aloud, the dignitary stands up and shouts a slogan, often reflecting institutional interest.³⁵ Next the

³⁴ The main cash crops in Nyanyadzi irrigation scheme are grown under contract. The local Agritex office and farmer committee for the scheme mediate in the negotiations surrounding its conditions. Normally the contracting company provides free seed to all farmers bound by the contract, promising to collect and buy their produce at a pre-arranged minimum price. The only limiting condition attached to such contracts is the prohibition of side-marketing, i.e. sale of the produce to outside buyers that often offer higher prices.

³⁵ Typical slogans are: *Pamberi neZANU(PF)!* (Forward with ZANU(PF)!) used by those affiliated with the political party or a government department (i.e. councillor, party leadership, Police, or Central Intelligence

whole group disperses for a quick visit to the field of the hosting farmer. Officials use their cars, the others walk.

Box 3.3: Ambuya Tendwa, the first female master farmer of Nyanyadzi¹⁴

Ambuya Tendwa, Kenya's mother, was born in the year of the locusts (1919). She was the third and last-born child, raised by her father and grandmother, after the premature death of her elder brothers and mother. She met her husband at Nyanyadzi school, got pregnant and left school in Standard 1. The young couple settled in nearby Nenohwe, where her husband came from. Life was hard, farming difficult. To make ends meet and pay for *lobola* her husband soon left to work in Salisbury (Harare). Later they married at the United Methodist Church in Nyanyadzi. She gave birth to four children, but they all died of snakebites or diseases. Later her husband left for Johannesburg, to work in the mines. She wanted to join him, but was withheld by the local Chief, who had also worked in Johannesburg. He claimed the place was not safe for women since there were robbers. Then her husband died in the mines.

Next, in 1937, she worked on the big canal in Nyanyadzi. This was the time of Alvord, Palmer, Sigauke and Mela Dube, the demonstrator. Alvord issued two acres of irrigated land to her, as was customary for widows. She had to work hard to clear the plot, often foregoing food. In 1947 she gave birth to Kenya Vumiso (Dube is the name of his totem). This was the year of drought. Yellow maize from Kenya was distributed in the area as famine relief. That's why she named him Kenya. She knows the father, but he never paid *rovora*. Kenya was not claimed by him, and Kenya himself never asked for his father. When Kenya was a toddler she built the brick stone house, where she presently stays with her son and his wife. Others had to help her, constructing a kiln to burn the bricks, building the roof. She paid the workers from proceeds raised on her plot. Was it hard work as a woman alone in the irrigation scheme? 'Yes you have to work hard, but it is not difficult. It is easy. You should work for yourself. There is no need to wait for a husband.' When Kenya had grown into adulthood, she was given one extra acre in block A, for his use.

Ambuya keeps her master farmer certificate behind a glass frame on the wall. She got the certificate in November 1960. The local demonstrator gave her the certificate after he had observed that she was able to cultivate. *Ambuya* Tendwa was one of the first plot holders to cultivate cotton. She was taught how to do it by the demonstrator. Even white inspectors came to see her field. They held a show at the training centre where she was chosen as the most highly credited farmer in the area. She was given a plough in appreciation of hard work. That was after she had explained what she had done in the field, what affected the cotton crop, and how to deal with the diseases. Then she was awarded the master farmer certificate and batch. She was the first woman to get it. During another show she won the fence that is surrounding her house. She prayed for Kenya, her only child, to get a job. Kenya wanted to become a policeman, but she disapproved. Fearing to be left alone, she went to see the African supervisor in the local irrigation office to ask for a job for Kenya. Possibly because she was a master farmer of some standing, the supervisor decided to give her son the job of water *bailiff* (gate operator). Because of age she later gave her fields to Kenya, who has copied whatever his mother was doing. Kenya confirmed his status as good farmer by attaining his master farmer certificate in 1984 and becoming one of only four advanced master farmers in the district in 1993.

Next the whole group reconvenes and the hosting farmer couple is invited to explain the 'secret of their success'. Normally the wife recites from a small notebook, the major agricultural activities undertaken (when she planted the seed, put the fertiliser, weeded the crop, etc). Next the responsible extension worker presents a crop budget, using government stipulated prices for inputs used and estimated yield attained. Fabulous profit margins are

Organisation); *Pamberi nekurima!* (Forward with farming!) by those in the agri-business (Agritex, agri-company, marketing board); or *Pamberi neField day!*, by those wanting to stress the importance of the event.

presented as proof of success,³⁶ and greeted by the crowd with clapping, cheering and ululating. All these events are interspersed with entertainment of one kind or another: traditional *Ndau* dancing, locally composed songs on the virtues of good farming, or regimented group dances by school children.

The following item on the agenda concerns the attending dignitaries, who one after the other promote the cause they are representing. Thus a kaleidoscope of the agricultural development industry is painted, varying from invitations to sell maize at GMB depots, to a public statement on the afforestation mission and policy of the Forestry Commission. Finally the highest-ranking Agritex officer is invited to give his view on the crop at display. He might engage in an interactive debate with the audience on the success formula behind the crop: a debate which rarely amounts to more than the collective reproduction of Agritex' mantra on timely planting, maintenance of correct planting distances, and application of correct doses of fertiliser. After this the company sponsoring the event is given a chance to promote its business. Often this involves the drilling of slogans concerning the virtue of the variety on display, or the dramatic throwing away of stunted maize cobs (we don't want bad maize anymore!), followed by lengthy monologues on varieties and performance of crops that the company has on offer. By this time most of the elder participants will be battling against sleep, and general attention will have waned.

The *coupe de grace* of the field day features no sooner than three hours into the hot morning: prices and promo-material of the company are handed out, sometimes by means of a quiz involving questions relating to the company's public relations story. Prizes normally involve agricultural inputs or implements, like knapsack sprayers, bags of fertiliser and seed. The prizewinners are often cheered publicly and sometimes toured through the crowd carried on the shoulders of eager supporters. After the meeting is closed with a prayer, the cold drinks and food are consumed in two separate groups: officers and other dignitaries first, the general public thereafter.

Master farmers, field days and competitions

An Agritex study of 20 randomly selected farming competitions held in Manicaland from 1984-94, found only six non master farmers winning the competition (Tapererwa and Chivizhe 1994, 9-10). Still, this was experienced as disturbing evidence of failure on the part of Agritex to produce capable farmers.³⁷ In Chimanimani district the majority of farmers hosting field days or winning competitions are master farmers or trainees (see table 3.6 for Shinja resettlement). It is only natural to expect master farmers to feature prominently during these events. Most master farmers are resource rich and grow the cash crops that Agritex wishes to promote. They also make up the inner circle of many extension workers. Since the extension worker in the area selects the host, and not the local farmers themselves, it is often those farmers that are most receptive to the extension workers' advice that are selected. Even if the extension worker knows of a better performing farmer in the area, operating independently, the latter is not often selected as field day host, since by doing so the extension agent would let himself down. Whilst many extension workers admit that there is a

³⁶ Often these budgets are highly fictitious. For instance, in Nyanyadzi nobody markets maize at the official Grain Marketing Board depots, for reasons of lack of transport. Yet in the crop budget for the two maize field days, profits calculations were based on the GMB price per ton. Equally yield figures used in these calculations are often based on inflated estimates, assuming the crop will attain a high grade.

³⁷ Since the majority of the winning master farmers was found to have graduated before Independence, questions were raised in the study on the practical abilities and calibre of master farmers produced after Independence.

lot to learn from a farmer who failed a crop, field days exclusively cherish those that reaped success. Thus the same 'tycoons' win farming competitions year in, year out. Equally, when an extension worker wants to try a new commercial crop in his area, he resorts to his proven performers to increase the chance of success. Thus when, in 1997, a paprika contractor started operations in Shinja resettlement scheme, the extension worker carefully selected his best farmers, and hosted a field day on paprika at the irrigated plot of a top performing master farmer. Extension worker Lydia in Nyanyadzi cherished the idea of luring competing crop contractors into the scheme by means of field days. Rather than stimulating competition amongst farmers, she used field days to foster inter-company competition. Thus, Kenya Dube became the host of the CARGILL maize demonstration plot, whilst his SEEDCO maize crop in the plot next to it was yielding much better.

Often local farmers *expect* their 'tycoons' to feature prominently at competitions. Only occasionally do young farmers, aspiring to win the competition or reap the benefits associated with hosting a field day, challenge the existing order. For instance, some Nyanyadzi farmers wrote a letter to the representative of the AGRI-SEEDS company sponsoring the beans field day in June 1995. They invited the representative to come and have a look at their beans crop, and compare it with the selected host farmer. The letter was copied and sent to the local Agritex office, where it created a stir. The extension workers responsible for the selection of the host farmer attributed the complaint to 'cheeky farmers', discarding the request in the process.

The actual performance of the field day often creates the impression of a ritual, with each actor playing its assigned role of champion (master farmer), promoter of development (extension agent), benefactor (agri-business company) or student (cheering audience). Again, occasionally 'cheeky' farmers might exert pinpricks against the dominant mantra of good farming. At the SEEDCO maize field day, a farmer remarked that he had only seen maize in the demonstration field: 'Where do these people get their relish? I saw no pumpkin or *okra* in the field.' The question was met with general laughter, reflecting appreciation for the man's questioning of the practice of monocropping.³⁸ Equally, during the beans field day, after the companies director had strictly forbidden any side-marketing on penalty of not offering a beans contract next season, the local madman stood up and shouted: 'You bloody capitalists! You are useless exploiters to us!'. The remark created many smiles in the crowd, whilst the chairman of the farmers committee hastily explained to the shocked director that the originator of the remark was mad.

Table 3.6: Field day hosts and crops in Shinja resettlement scheme, 1991-98

Year	host	crop	irrigated?	Remarks
1991	mf	cotton	no	
1992	mf	cotton	no	
1993	mft	<i>mhunga</i>	no	
1994	mf	cotton	no	winner 2 nd prize ZFU district competition
1995	mf	cotton	no	also hosted 1991 cotton field day
1996	mft	cotton	no	winner COTTCO provincial competition
1996	-	cotton	no	sole female host
1997	mft	cotton	yes	
1998	mf	paprika	yes	host to five previous field days

Source: Agritex Bumba office and author's observations

Key: mf = master farmer; mft = master farmer trainee, COTTCO = Cotton Company, ZFU = Zimbabwe Farmers Union

³⁸ A majority of farmers in Nyanyadzi grows pumpkin, *okra* or other vegetables together with their maize crop.

In general, farmers and extension officers evaluate the success of a field day in terms of the quantity and quality of food, entertainment, or promotion material offered. For the hosting master farmers, a field day is often experienced as an expression of good social relationships, offering opportunities to further their network. A good field day confirms their status as 'islands of salvation', making them prone to visits from VIPs and external development agents, that want to further the cause of agricultural development. Elias Marowa, the experienced master farmer who hosted no less than six field days in Shinja resettlement scheme (see table 3.6), knew several expatriate aid workers by name and claimed he was good friends with the Minister of Lands and Agriculture. His acquaintance with these people of influence dated back to personal encounters at field days, shows and individual visits hosted at his farm.

Field days and shows as administrative modes of ordering

Most extension workers perceive field days not as 'learning events', fostering the effect of trickle-down otherwise known as extension, but as events to legitimise their *raison d'être* as state agents committed to modernity, development and commercialised smallholder agriculture (cf Worby 1998, 575). In a similar vein, agricultural shows are used as venues to stress the importance of Agritex and other state agencies, in the process legitimising their rural development policies.

The performance of shows matches that of field days in its ritual proceedings: speeches by dignitaries are interspersed with local entertainment culminating in the celebration of the heroes of agricultural progress. But instead of concentrating on one crop, the show takes the appearance of a fair, where a variety of displays cover crops, livestock, crafts and horticultural sections. Before the actual officiating ceremony is performed, a number of visiting extension workers is engaged in scoring the exhibits, thus determining the winners for each section plus the overall winner. Scoring is based on an anonymous assessment of the quantity, quality and uniformity (e.g. in colour and size of grains) of the exhibits on display. Competing farmers have to pay an entry fee to join the show. Those aspiring to win make sure they have many entries of a uniform quality, since the scoring procedure favours those who display many different products. The nature of the scoring procedure makes it prone to manipulation, a fact farmers and extension officials are keenly aware of. Dzingirai (1992, 142) cites two examples of farmers winning prizes with forged entries. In one case a cotton sample was acquired from a neighbouring irrigation scheme, whilst in another case a dry land farmer bought his price winning rice sample from a local shop. In Chimanimani the district farmer delegation joining the 1996 provincial show was supplied with fresh vegetables for display by two extension officers and the District Administrator, eager to promote the performance of their district.

Shows mark the end of the growing season, travelling like a moving circus from remote areas all the way up to the national show grounds in Harare. Shows are cheerful events where a lot of beer drinking, spontaneous dancing, back slapping and raving speeches by eager politicians are delivered. Rather than a competition amongst farmers, the show circuit celebrates the development efforts of state agents. For example, the fact that Shinja communal area, a poor farming area, hosted an agricultural show for several years in a row, was commented on favourably by local Agritex officers and the District Administrator. The Shinja councillor, eager to demonstrate his development efforts and furthering his attempt to be recognised as the official headman in the area, managed to find sponsors for the prize-giving event. So, whereas the Shinja show was considered poor in terms of the number of participants and quality of displays, it was cherished for its valuable prizes (in 1998 a

television set was awarded to the best competitor). Equally amongst extension workers the organisation of an area show, however poorly attended, is seen as a perk. The extension worker for Chayamiti, another poor farming area, was profusely congratulated by his colleagues when he hosted the first post-independence show in the area in 1996. His efforts also reflected well on his personal job assessment form for that year.³⁹ The 1996 show in Shinja resettlement scheme was characterised by a record number of participants (193), due to an innovative way of collecting entry fees in kind, rather than in cash. Officers in Chimanimani beamed with pride, not so much for the success of the show, but because their visiting provincial boss was thus bound to get a good impression of their district. When the Mutare district delegation won several prizes at the national agricultural show in 1995, a letter of congratulation was circulated by the provincial Agritex office amongst all district offices, likening the achievement to the winning of a 'gold medal' at the Olympic Games.^{xv} The Chimanimani District Administrator further confirmed the use of shows as administrative mode of ordering, when he declined to perform as guest speaker at the 1996 Nyanyadzi area show. He was disgruntled by the fact that he was only invited to perform the vote of thanks, a minor task which he regarded as an insult to his office.

3.5 THE MASTER FARMER BADGE: A TICKET TO STATE MEDIATED RESOURCES?

As shown above, extension workers have their reasons for working with master farmers. In this section the reciprocity of this innate relationship is discussed. Master farmers actively foster their relationship with the local extension agent, since the latter is the main portal to state mediated resources like heifers distributed under the communal area re-stocking programme in 1997. However, first some master farmers of Chimanimani district are studied to find out which came first: the chicken or the egg? Is it that productive farmers that are well-endowed in terms of resources and farming skills merely confirm their status by becoming master farmers, or is it that master farmer training turns them into the high performing farmers the programme envisages?

Master farmers: the quest for status, security and leadership

Shinja resettlement scheme is characterised by a high concentration of master farmers amongst its official settlers (23%, see table 3.2). These master farmers make up a farming elite that shares access to above average land and stock holdings and/or access to irrigated land. They are responsible for the bulk of marketed production of cash crops like cotton, tomatoes, peas and maize, and they perform the agricultural and, to a lesser extent, the political leadership roles in the area. The question is whether the master farmer programme and its model of commercial farming is responsible for the emergence of this elite.

Taking the case of the three master farmer trainees examined in 1996 (see 3.4), it appears they all enjoyed a head start in either farming resources or skills, dating from before their engagement with the programme. Shinja resettlement scheme had already been 'invaded' before becoming the object of official resettlement procedures and policies in 1983-84. By that time some settlers, either with or without permission of the district ZANU party committee, had set themselves up on the best farming land often enjoying access to existing irrigation furrows. Two out of the three master farmer trainees belonged to that category, though Mutakura dug his irrigation furrow together with two fellow settlers in 1981. During official resettlement in 1984 Mutakura was forced to take up a different plot of arable land,

³⁹ In 1996 personal job assessments were introduced in Zimbabwe's civil service in a bid to improve its performance. Agritex extension workers were assessed on their execution of the master farmer training programme and the hosting of field days and agricultural shows in their area.

further removed from the river, but he managed to maintain his claim on the irrigated plot. In addition, Mutakura brought with him several heads of cattle, a car and some farm implements, which he had accumulated during his career as farm foreman on one of the resettled farms in the area. The job offered him opportunities to develop his farming skills and business acumen (he opened one of the first tuck shops in the area). The third trainee, Satiya, got only resettled in 1987, on one of the well-watered upstream fringes of the scheme. Being a war veteran he had qualified for resettlement and drawn a lucky number.⁴⁰ In 1989 Satiya dug an irrigation furrow commanding a large stretch of alluvial land situated below his rain-fed plot. His position of top ender on the Shinja river allowed him to irrigate continuously, even during the 1991/92 drought year, when most furrow irrigators were forced to cease their farming operations. Satiya further used his status of war veteran to qualify for AFC loans⁴¹ and cash from the War Veteran Compensation fund. He carefully injected the cash thus acquired in his farm and managed through irrigated contract farming to augment his wealth. Of the three trainees he made the most beneficial use of the farming skills imparted by means of master farmer training.

All three trainees resented the extra work they needed to undertake to qualify for the programme, judging their examiner as 'too strict'. Still they executed their examiner's suggestions to the letter, setting out to build a tool shed, modify the cattle kraal, and enlarge or construct new storm drains. Considering their ordeal, it is legitimate to wonder why these three wanted to qualify as master farmers in the first place. All three pointed at their interest in future land security and viewed the acquisition of a master farmer badge as an obligatory passage point on the road to acquire more land or other agricultural resources distributed through the state.

This is hardly surprising considering the previous use of the badge as qualifier for acquiring freehold land in small-scale commercial farming areas. Ongoing debates on the need to improve resettlement performance through the selection of agricultural graduates and occasional threats from the Resettlement Officer on withdrawing farming permits from bad performers,⁴² only served to strengthen this argument.⁴³ Additional motivation for becoming a master farmer is the status it confers on its holder. Kenya Dube, the master farmer from Nyanyadzi, proudly wears his badge at every public occasion. In other cases the programme is used to establish friendly relations with the extension worker operating in the area. Elias Marowa, upon settling in Shinja resettlement scheme attained his master farmer certificate for the second time in 1985, for exactly that reason.⁴⁴

All master farmers experience their relationship with the local extension worker as a valuable asset, maybe not so much for reasons of learning about farming innovations, but for reasons

⁴⁰ During official resettlement, arable plots were demarcated and numbered. Qualifying settlers were then asked to draw a number, like in a lottery.

⁴¹ During the 1980s the issuing of AFC loans in Shinja resettlement scheme was subject to political connections with the ruling party. Favourable party connections often resulted in adjustment or wavering of loan repayment schedules. By the 1990s the cash-strapped AFC had virtually ceased supplying loans in the area. Information gathered from local Agritex and DERUDE staff, and the AFC provincial representative.

⁴² The annually renewable permits to reside, stock and cultivate in a resettlement area authorised such action. However, in Shinja resettlement scheme these permits were no longer of relevance, certainly not after the 1994 Land Tenure Commission had recommended the provision of 99 year leases to settlers.

⁴³ An extension worker in Chimanmani district confirmed this motivation indirectly. Her explanation for the concentration of master farmers and number of trainees in irrigation and resettlement schemes was that in those schemes you could induce settlers to embark on master farmer training by threatening with eviction.

⁴⁴ Marowa attained his first master farmer certificate in neighbouring Shinja communal area in 1975.

of extending their farming operations. They keenly appreciate the pivotal role played by the extension worker in moderating and facilitating agricultural initiatives that originate from external sources like NGOs or government administered programmes. It was with help of Agritex and the local Resettlement Officer that 34 of the most productive resettlement farmers set up a cooperative in 1990. The *Chiseko* cooperative started in earnest in 1994, endowed with Z\$60,000 starting capital provided by a Swedish donor agency, and supplemented with a cash inlay of Z\$150 from each participating (master) farmer. The cooperative runs a shop and procures inputs in bulk at reduced prices. Occasionally the cooperative also does maize marketing, particularly since the closure of the local GMB depot in 1994. In 1997, the cooperative had a cash balance of some Z\$83,000 (US\$7,000) in the bank and had paid out annual dividends of Z\$250 (US\$21) per member. Master farmers also play a prominent role in organising area shows and ZFU farming competitions. Thus they perform the type of agriculturally inspired leadership that Alvord expected of them.

Yet whilst all master farmers in Shinja resettlement scheme and Nyanyadzi catchment area are wealthy farmers,⁴⁵ using resources previously acquired by means independent of the programme, not all productive farmers are master farmers. The two most productive farmers in the scheme, each producing at least 100 tonnes of marketed maize annually, had not taken the trouble of becoming a master farmer, for their own reasons. Mukute, a former farm foreman, had received his tractor and car from the white farmer he used to work for and claimed he did not need training on running a farm. The other tycoon concerns a headmaster who is involved in extensive (illegal) share cropping, providing free inputs and ploughing services in exchange for half the yield produced by official settlers. The headmaster was not eager to engage with the extension worker for obvious reasons.

Master farmers pick whatever they like from the improvement package offered by the programme, whilst often they expand their farming, business and socio-political networks beyond those of the model smallholder. Kenya Dube and other prominent master farmers in Nyanyadzi irrigation scheme actively expanded their land base by hiring plots from less productive plot holders, thus breaking out of the straitjacket of the maximum permissible holding of four acres. In Shinja resettlement scheme it is often master farmers that take on leading positions in the local VIDCO to expand their farming networks by mediating and actively shaping new development initiatives in the village.

The heifer loan scheme and the search for bankable farmers

As part of the national programme to re-stock communal and resettlement area herds, hard hit by the 1991/92 and 1994/95 droughts, Agritex Chimanimani administered the so-called heifer loan scheme. Under the scheme, eligible farmers could acquire a maximum of two heifer calves against soft loan conditions. In July 1997 the district office distributed application forms through its network of extension workers. Initially only three forms were issued per extension worker in an attempt to limit the number of applicants and spread the allocated 90 heifers as widely over the district as possible. However, pressure exerted by influential (master) farmers on local Agritex staff soon set the printer rolling, increasing the number of applicants tremendously. The selection committee was made up of Agritex, the department of veterinary services, the DA's office and the ZFU. Heated debate on the selection criteria resulted in the production of several lists of potential beneficiaries. In the end 48 farmers benefited, concentrated in 9 out of Chimanimani's 25 wards.

⁴⁵ A rather obvious reason for master farmers being wealthy farmers before they embark on the programme, is provided by the requirements of the programme itself. Without oxen and some financial reserves it is a difficult task to undertake the risky commercial crop ventures endorsed by the programme.

The question is to what extent master farmers, being the favourite clientele of the administering agency of the programme, managed to benefit. A quick glance at the ultimate list of beneficiaries yields three distinct categories constituting the clientele of the selecting institutions, i.e. the party, Agritex and the ZFU. In Shinja resettlement scheme a disproportionate number of 20 settlers proved eligible, whereas initially only six settlers had been put on the list. Only four did not have a master farmer certificate, the ZANU(PF) branch chairman being one of them. Amongst the 16 master farmers were four VIDCO chairmen and three ZFU leaders. In other areas heifers were spread over a kaleidoscope of farmers qualifying either on a party ticket (i.e. three related teachers in Mhakwe), master farmer badge, or office relations (three office orderlies employed in Chimanimani government departments). In Nyanyadzi irrigation scheme four non master farmers without party of ZFU connections qualified.

As is customary in the event of a government agency distributing highly desired goodies that are warmly and widely recommended by local political leaders, the Agritex office took a lot of flak over the ultimate allocation. The distribution of highly prized government resources like cattle always involves a careful balancing act, reflecting the constellation of powers that be. The performance of such a balancing act requires a keen political awareness amongst Agritex personnel. Within Agritex the main criteria for selection were the bankability and need for cattle of the candidate: how much livestock does he have? Is he able to service the loan? Those criteria no longer automatically guaranteed master farmers to qualify. The extension worker for Nyanyadzi commented that she had received complaints from local master farmers whose applications had been turned down:

'This Mushonga came to complain, saying he was a master farmer. Pfff, what kind of farmer is he? Did he produce maize? Nil! Did he grow beans? Nothing! That one is a typical master farmer: he doesn't produce, but he passed the exam because he can read. Then take this Magoba and Mutunzi, who got the heifers. Surely they are good farmers, they can produce, but their academic levels are low. They were in the same class as Mushonga, but they failed the exams. And they said we can not again join your training sessions in master farmer, because you gave Mushonga a certificate, because he is able to read and write.'^{xvi}

As shown above, in the resettlement scheme such problems did not occur: most bankable farmers there also happen to be master farmers. In Mhakwe more stiff resistance was organised against the allocation of heifers. Members of the local branch of the ZANU(PF) women's league thronged the Agritex district office, and a prominent master farmer, who also happened to be a member of the provincial ZANU(PF) politbureau, came to complain in person, questioning why he and his people had not benefited, whereas three teachers at the local school had. For a moment the Agritex district office became caught up in an internal party struggle. The three teachers were sons of an old party stalwart who represented a different faction in the Mhakwe ZANU(PF) branch than the politbureau member and his fanatic women's league following.⁴⁶

Wealthy master farmers and their extension worker: intimate bed fellows

In conclusion it can be observed that whilst not all wealthy farmers are master farmers, virtually all master farmers are wealthy farmers. The reason for the first group to refrain from becoming master farmers is that their accumulation and farming strategies do not augur well with the programme. The prime reason for the second group to qualify as master farmer is the

⁴⁶ In the event the local Agritex officers managed to fend off serious repercussions by sheltering behind the authority of the District Administrator. Later an officer commented to me that they had simply gambled on the wrong party faction.

access that the programme provides, through the local extension worker, to state-mediated resources and development initiatives from other agencies, such as agri-business companies and NGOs. Thus master farmers can expand their farming operations and increase their livelihood security. However, by 1997 the distribution of state mediated resources (such as heifers) was no longer exclusively directed at master farmers, but subject to the interplay of a variety of legitimating discourses (e.g. political, financial, and patrimonial). The latter process presupposed keen political acumen on the part of government bureaucracies.

3.6 CONCLUSION AND DISCUSSION: RISE AND DEMISE OF THE MASTER FARMER

This conclusion reflects on the riddle of extension presented at the start of the chapter before delving into the matter of the persistence of the master farmer model in smallholder agriculture. Its exclusionary and uniform features rendered the model of limited value in igniting an agricultural revolution amongst smallholders, whilst its use in terms of creating a loyal class of yeomen peasants was equally limited in both Rhodesia and neighbouring countries that adopted clones of the programme.

Agritex, TOT and neo-liberalism: time to disappear?

The neo-liberal economic policies of the 1990s made Agritex' mission of commercialising the smallholder farmer by means of the master farmer model difficult, if not impossible. Agricultural services packed up, restricting their reach to areas in the vicinity of major markets (i.e. urban perimeters) and areas along major lines of communication (Worby 2001). Chimanimani was badly situated on both counts. At the same time budgets for state agencies like Agritex and DR&SS were shrinking, prohibiting the emergence of viable smallholder technologies. The question is whether this would have happened even in a favourable policy environment, since the TOT model seems ill suited. It is not responsive to the contextually informed needs of a mixed clientele employing a variety of farming strategies or styles. Major innovations, like new drought resistant maize varieties, now originate from transnational companies. New avenues for commercial smallholder farming opened up after the mid-1990s, exemplified by the expansion of smallholder contract farming in paprika, but these were limited to those areas where concentrations of relatively secure (irrigation) smallholder farming was taking place.

By the time some officials in Agritex realised that the complicated nature of their mission required a rigorous re-orientation, drawing on the very African indigenous cropping practices Alvord had sought to eradicate, it was too late. Conditions of pay and operational modalities deteriorated. Research stations closed down. Officers left Agritex in droves, gathering degrees to open the door to greener pastures. 'Time to disappear' as the Extension officer in the opening quote of this chapter foretold his audience. But of course Agritex was not to disappear, since it also performs a crucial role in the exertion and implementation of state control in the rural areas. Agritex' geographical span as a state agency responsible for agricultural development expanded even further in response to widespread farm invasions during the late 1990s, though its technocratic policies were overruled by a new politically informed discourse. When at long last, the Departments of Research (DR&SS) and Extension (Agritex) were merged into one department of Agricultural Research and Extension (AREX) in the early twenty-first century, allowing for smooth communication, the very state that nurtured them had gone bankrupt.

The continuity of extension practices: master farmers never die

'Master farmers never die', observed an extension officer commenting on the practice of keeping a national register of graduated master farmers. The national registry only records new entries, failing to remove old entries that passed away. The quote aptly describes what has happened with the master farmer programme in general: it is there to stay, even if it turns into a virtual reality. The latter phenomenon is reflected in the highly ritual character of field days and agricultural shows, where wealthy master farmers are still celebrated as the heroes of progress, in order to legitimise state intervention. Thus the improvement package contained in the master farmer model has become the subject of ongoing standardisation, to the extent of becoming part of a process of administrative fossilisation. The components of the package have become frozen in time and space. It has remained virtually unchanged since its originator Alvord composed its defining components, and it is celebrated only within administrative circles, finding its place as an ideal mode of ordering within the rank and file of Agritex.

Many authors have commented on the continuity of the package and its marketing strategies. Drinkwater (1991) attributes its persistence to an overarching type of technocratic rationality that haunts Agritex officers. Alexander (1993, 1994) has pointed at the unchallenged nature of NLHA policies, explaining their persistence in the way these policies suit the minds and objectives of administrators seeking to control and contain the aspirations of the masses that stay in the communal areas. My own thesis is that the model of the master farmer suits the purpose of administrative visibility, whilst its implementers have inculcated the ideals of modernity, mixed farming and Christian morality that come with the model. The fact that a considerable part of Agritex personnel was raised on a small-scale commercial farm in a Christian home has shaped and strengthened their drive for commercial agriculture at a scale proposed in the model. These officers and extension workers made up the 'political clout supporting the programme', Madondo (1993) referred to. To other Agritex personnel, raised within the confines of marginal agricultural areas (i.e. the majority of the communal areas), the attempt to copy successful European large scale commercial farmers at a small-scale makes inherent sense, since it promises the very bounties of modernity they sought themselves when they escaped the communal areas for an administrative career. Whilst it seems many extension workers suffer from a form of *schizophrenia*, advising their clientele to practise monocropping, whilst helping out mom on her intercropped maize and pumpkin field on holidays at home, it is a perfectly normal practice if one considers that the extension worker conceives of himself and his job as a vanguard of modernity aspiring to leave the miserable conditions *kumusha* (at home). When doubt on the viability and desirability of the model emerged by the mid-1990s the paraphernalia and rituals attached to it remained, since there was no other model readily available on the shelf, and the present model suited at least its administrative purposes of on-going legitimation and visibility.

Another persistent feature of the master farmer model is that it allows the state to regiment and discipline its subjects into neatly defined individuals (Foucault 1977). The recurrent conservationist narrative of impending ecological disaster in communal areas has fed this need for state-orchestrated surveillance of the African populace and their 'destructive' agricultural practices. Agritex and its illustrious predecessors have used the master farmer programme as a vehicle to establish a modern society constituted of individual farming households producing for the market without ruining its resource base, thus breaking the conundrum of African tradition, kin based society and environmental destruction. It is through the procedure of the master farmer examination, which combines hierarchical surveillance and normalising judgement (Rabinow 1984, 204), that state power produces its

modern subject, called master farmer. Thus it is that master farmer training became the linchpin of the state-led modernisation project, producing neatly defined subjects that allowed the modern state to exert control over its population. To what extent this state production of modern society was successful is another matter, addressed below.

The exclusionary and uniform features of the master farmer model

The master farmer model provides for an ideal mode of sociotechnical ordering, whilst the master farmer, his nuclear family, his agricultural practices, accumulation strategy and modern life-style make up a actor-network. This actor-network supposedly draws on a uniformly prescribed mix of natural, human, social, economic and moral resources to perform commercialised agriculture at a small-scale, maximising farm output per unit of land, within the orbit of a Christian nuclear family.

Not every social actor in the communal areas is capable of mobilising (enrolling) the necessary resources making up such an actor-network. The average communal area dweller lacks either access to labour, cattle, capital or (rain)water to successfully compose the heterogeneous whole called master farmer. As a consequence the programme caters exclusively for those that, by whatever means, have succeeded in amassing a wealth of at least two of these four resources. Of the latter, water is the most critical resource. Such is reflected in the numerical and spatial distribution of master farmers. Nationally their number covers only 6% of the total farming population, in Chimanimani this is even less (2.3%). In spatial terms their number is over-represented in natural region 3, the agro-ecological zone which best suits mixed farming, whilst in the arid environment of natural region 5 hardly any master farmer can be found. In Chimanimani district, access to irrigated land and to some extent draught power is critical for attaining the master farmer standard. With these observations the hope of using the master farmer as a trigger, kick-starting a process of diffusion (trickle-down) across whole communal areas, is dashed. For one reason or another the model does not replicate itself, and seems ill suited to do so. Yet, their status as heroes of agricultural progress combined with their relatively wealthy position makes master farmers the favourite entry point for any new agriculturally related development initiative or innovation. This is partly the result of the active networking of master farmers themselves, using their celebrated status to expand their social network of relations with agri-business representatives, extension agents and administrators.

Inculcated in the model of the master farmer is a uniform approach to farming, condensed in the so-called master farmer standards. These standards are to a high degree institutionalised, i.e. externally prescribed and sanctioned, as transpired from the performance of master farmer exams and the aura of 'scientific' validity that surrounds the package. In Van der Ploeg's (1990, 11-12) words this uniform structuring of relations between producers, objects of labour and means makes up a particular farming style. The style inculcated in the master farmer model capitalises on the maximisation of agricultural production per unit of land, mimicking the mixed family farm that dominates the agricultural sector in the Western Hemisphere. Yet, master farmers themselves employ a variety of farming styles building on or breaking with previously established farming practices and socially and morally informed relationships. Depending on the availability of resources, mediated by the local agro-ecological context and existing reservoir of cultural dispositions, master farmers either go for a traditionalist farming style capitalising on labour, or a modernist style capitalising on intensified land use. Rather than supplanting previously established social kin based networks and locally refined farming practices, master farmers have a propensity to pick whatever they like from the farming model to build their own actor-network of resources, labour and life

styles. This confirms the maxim that new modes of ordering sociotechnical networks evolve from previously existing modes of ordering. The on-going standardisation and institutionalisation of the master farmer model never catered for these different styles of farming. Within Agritex any deviation from the standard model of farming was seen as an indication of non-adoption or drop in 'quality' of master farmers.

My contention is that rather than disapproving the heterogeneity of farming styles espoused by the master farmer training programme, Agritex (Arex) better base and refine its efforts to improve smallholder agriculture on the variety of farming styles found in communal and resettlement areas. As shown by the training sessions presented in section 3.4 such flexibility to adapt the programme to suit local agro-ecological circumstances and socio-economic endowment is already practised by the front-line workers. Rather than cherishing the doubtful scientific validity of the master farmer model, Agritex could use its long term establishment and experienced human resource capacity to facilitate and craft sustainable farming strategies by means of mutual learning processes. This would make the master farmer training programme a lot less uniform and exclusionary, and a lot more relevant to the kaleidoscope of sociotechnical networks found in Zimbabwe's rural areas.

Breaking out of the straitjacket of small-holding: the loyal class thesis re-visited

Whilst the master farmer model is constrained by its exclusionary and uniform prescription, it is equally limited in its proposed scale and span. Master farmers often aspire to go beyond the scale of a smallholder farmer contained in crowded communal and resettlement areas. This has been a characteristic of the programme from the very start, as succinctly demonstrated by the escape from the Reserves into commercial farming ventures by first generations of master farmers and their agricultural teachers. Later this flight from the Reserves was institutionalised. Master farmer status became a prerequisite for settlement in Purchase areas and post-independence resettlement areas.

Some authors (Cheater 1984, Weinrich 1975, Kalinga 1993) have argued that the escape from the Reserves has been actively fostered by a colonial state eager to build a loyal, yeoman class of progressive freehold farmers providing for political stability during an era of widespread African nationalism vying for Independence. Within Southern Rhodesia the political and physical space for the emergence of such a vibrant commercial freehold class of African farmers had already been created in early drafts of the Land Apportionment Act, setting aside land for Special Native Areas (Ranger 1970, Palmer 1977b). Reluctantly and slowly this space was filled with some of Alvord's modern men, producing some 8,000 small-scale commercial farmers at Independence. Their numbers were too small to perform the stabilising role ascribed to them, though they did provide for a moderate African opinion that firmly identified itself with the modernist project. The African Farmers Union that emerged from their midst still formed the backbone of the Zimbabwe Farmers Union in the mid-1990s. During the liberation war, master farmers and African freehold farmers became subject to attacks by 'freedom fighters', thus confirming their image as loyal subjects of Smith's regime.

Within the context of rising African nationalist movements in the 1950s, many British colonies in east and Central Africa embarked on initiatives fostering the establishment of a loyal yeoman class of African farmers. Such initiatives found expression in the Land Consolidation Plan (1953) and Swynnerton Plan (1954) in Kenya; the African Farming Improvement Scheme in Northern Rhodesia; and various other grand development schemes in Uganda and Tanganyika (Kalinga 1993, 368). The Southern Rhodesian master farmer

programme became part of this political strategy in Nyasaland and South Africa. How did these copies of the programme fare? In Nyasaland the master farmer scheme was adopted after the disastrous famine of 1949, attributed to a breakdown in the African community spirit, opening up room to concentrate agricultural improvement efforts on the 'best individuals'. Two categories of master farmers received bonus payments for practising agriculture along the lines of Alvord's ten commandments. The programme never spread far and after the adoption, in 1956, of strict punitive measures against those practising unrecommended agricultural practices, participating master farmers became subject to African nationalist aggression. In 1962, with Kamuzu Banda rising in power, the programme was abandoned (Kalinga 1993). In South Africa the master farmer programme fared slightly better. Adopted in 1947, the programme involved agricultural demonstrators propagating an evolutionary farm improvement model along the three stages of pupil-improved-master farmer, similar to the Rhodesian programme. Again the spread of the programme was limited (covering 2.5% of all farmers in 1965), and by the mid 1970s the government phased out the master farmer hierarchy encouraging extension agents to spread their advice more widely across the agricultural community (Duggan 1986, 196).

These two experiments with master farming display a number of striking similarities with the programme in Zimbabwe. The programmes all catered for resource rich farmers mostly using the proceeds from migrant labour careers to qualify in the first place. In Malawi and South Africa the programmes were abolished in favour of more egalitarian development initiatives. Finally in all three varieties of the programme the main incentive for becoming a master farmer laid not in the model of mixed smallholder farming practices that the programme propagated, but in the access to state mediated resources that adoption of the master farmer status promised. In Nyasaland it was the provision of state subsidies (bonus payments) and promise of consolidated land titles that attracted participants. In South Africa it was the provision of loans to acquire tractors and scotch cards, and in Zimbabwe the provision of freehold land and, later, resettlement land, plus a host of other state mediated agricultural services. The latter promise of expanded farming operations and a better life on a more secure basis formed the only incentive for communal area farmers to join master farmer training in the mid-1990s. However, with the subsequent collapse of Zimbabwe's economy, politisation of state agencies and denouncement of European inspired modernity by Mugabe's regime, it has become questionable whether the model of the commercialised smallholder farmer holds any attraction at all in Zimbabwe *anno* 2004.



Photo 5: View of the Nyanyadzi irrigation scheme, 1950
(Source: National Archives of Zimbabwe, photo collection no.22364)

INTERMEZZO 1:

TECHNOGRAPHY OF AN IRRIGATED SETTLEMENT SCHEME

The link between part one (field level) and part two (scheme level) of this study follows automatically from Alvord's evolutionary model of modernising African agriculture involving scaling up from the household to the Reserve (see 2.4). Alvord hoped to achieve a rapid path of modernisation by means of the creation of a highly productive irrigated settlement scheme in what was perceived to be an empty space (*tabula rasa*) plagued by frequently recurring famines. The marginal agricultural use of the Save valley and the scarcity of original inhabitants, allowed Alvord and his staff to craft a modern irrigation society from scratch, without having to overcome resistance in the form of established 'wasteful, heathen' practices. Nyanyadzi scheme became an ideal field laboratory to test and realise Alvord's development vision (see Photo 5). By the time of his retirement, Alvord considered Nyanyadzi scheme his biggest success, and had cloned it manifold across the Save valley (Alvord n.d., 1958). The status of Nyanyadzi as a paradigmatic scheme for smallholders in Zimbabwe was confirmed in an economic survey by a government economist (Hunt 1958), which found that Nyanyadzi was the only profitable African irrigation venture in the country. This status quickly changed after independence, when Nyanyadzi became emblematic for malfunctioning 'old schemes'. A similar change of fate can be observed for the so-called irrigation factory schemes in the whole of sub Saharan Africa (see 1.2).

In this intermezzo a new methodological lens (technography) is presented to describe and analyse the life of the scheme and the various actors involved in (re)shaping it. Critical conceptual notions in a technography are life-phases, dominant and counter discourses, technologies of water control and strategies of (re)-appropriation. Next the rationale for the technography of Nyanyadzi scheme is presented.

TECHNOGRAPHY: BRIDGING THE NATURE-SOCIETY DIVIDE

For a full understanding and analysis of success and failure of irrigation factories, it may be necessary to bridge conventional disciplinary dichotomies, of which the nature-society divide is the most pernicious. In order to bridge this divide I propose a new methodology, called technography.

What is technography?

A great variety of definitions of technography is presently in use in various study fields (see box i.1). In my own conception, technography is a methodology that describes and analyses the life of a technology as well as the various actors involved in (re)shaping it. Thus technography is a short hand for a combination of biography, technology and ethnography.

My conception of technography is based on three methodological principles that tackle deficiencies in conventional analytical and policy perspectives on irrigated settlement schemes (see table i.1). In particular I take issue with the epistemological separation of the social from the technical, and the ontological separation of technology design from

technology use. With regard to the latter I propose to make a distinction between iterative processes of design, that precede periods of stability in the shape of the scheme, and processes of stabilisation, that focus on the contested nature of the use that is made of the scheme.

Box 1.1: Different definitions of technography

(1) The Collins English Dictionary (2000) defines technography as 'the study and description of the historical development of the arts and sciences in the context of their ethnic and geographical background.'

(2) In computer science, the term technography is used to describe: 'the collective employment of one person as computer operator for the purpose of arriving at a collaboratively-authored document.'

(3) In the context of Technology Studies and Sociological Studies of work and organisation: 'technography means describing the work in relation to technology as a specific social order. This social order is produced by interactions among the workers and their interactions with artefacts' (Braun, Rammert, Schubert, 2002). In a similar vein Knorr-Cetina (1999, chapter 5) uses technography to analyse different epistemic cultures amongst scientists.

(4) Finally, Paul Richards' coining of the term expresses a desire to develop an ethnography of technology based on empirical observation (Ingold 1994, 336). Technography in this sense is a shorthand for 'analytical description of technologies, or studying technology for what it is' (Perrin 1992, 10). Like Ingold, Richards (2000, 19-20) aims to treat 'the tool, action and agent as a complex package of embodied performative behaviours', adding a specific focus on the social organisation of the task group(s) involved in developing and using the studied technology. The basic aim of technography is to understand 'the engine room of technology, and its navigational process'. Richards (2000, 24) wants to produce a sociology of team work at all levels of the food production chain, from laboratory to farmers' fields, to understand 'how task cultures shape (but also potentially squander) technological opportunities.' When the research path is aligned to the users' problematic, success is the likely outcome (Ibid, 30), in the process providing an alternative to top-down, high-tech green revolution technology (Richards 2001).

Table i.1: Outline of principles and key concepts in the technography of irrigated settlements

Field	Principle	Key concepts
Epistemology	Interdisciplinarity	water-network alignment strategy
Ontology	Iterative design process	life-phases shifts in discourse/paradigm
Ontology	Contested stabilisation/closure	technologies of water control counter-discourses strategies of (re)appropriation

Neither social nor technical engineering: interdisciplinarity

As highlighted in chapter 1.2, irrigated settlement schemes have been imbued with grand transformative capacities, reflecting the technological optimism of the day. It was believed that by means of a new technology, African societies could be modernised and developed and (semi-)arid regions would be transformed into baskets of food and raw materials, devoid of famines. The radical societal changes attributed to these schemes explain both the rise of irrigation factories in Africa as well as their demise in the post-colonial period, when sustained success proved rather elusive and the schemes were blamed for producing all sorts of social, economic and environmental maladies. At the core of this debate on success or failure of the irrigation factories lies the fundamental question who is driving changes in the

technology-society nexus. Is technology the agent of social change (progress) on account of its 'invincible rationality' (Shah 2003, 7)? Or is change the exclusive domain of society since social actors are the only actors capable of intentionally devising new technology? Radical answers to this question manifest two forms of determinism with regard to the role of the object in fabricating change: either society is determined by technology (technological determinism)¹ or technology is determined by society (social determinism).

These two forms of determinism represent the extreme ends of a continuum of mono-disciplinary reductionisms that have strongly influenced policy recipes affecting the rise and demise of irrigation factories. Such reductionist policy recipes share an orientation on one-dimensional identification of causes of malfunctioning and often result in privileged solutions. Thus neo-liberals have focused on 'getting the prices right' in order to let the 'invisible hand of the market' do its beneficial work (Repetto 1986); neo-institutionalists focus on getting the 'institutions right' propagating a retreat of the predatory state in favour of decentralised, user based forms of management (Ostrom 1990, 1992). Finally, engineers have stuck to their focus on 'getting the technology right', aiming at more refined forms of water control through infrastructural rehabilitation programmes and the introduction of modern (sprinkler and drip) technologies (Plusquellec *et al.* 1994).

In contrast this study uses a sociotechnical perspective. An irrigated settlement scheme can be analysed as a sociotechnical network, or water-network, in which heterogeneous networks are purposefully built around the technical object (Akrich 1992, 206). The object of study in part 2 of this thesis is the settlement scheme, and this *object needs to be analysed interdisciplinary, that is the physical/technical and the social need to be analysed simultaneously, as different but internally related dimensions of a single object* (Bolding *et al.* 2000). Unfortunately in almost all studies of settlement schemes scant attention is paid to the interplay between technology, nature and society. Most studies are either socially, economically, politically or technically oriented, and stick to a rigid division and analytical separation of material and social (f)actors. It is my contention that these studies only partially explain success and failure, since it is the aim of those driving and mending the water-networks to produce working wholes by re-aligning social and material elements in such a way that it attains the desired outcomes. Critical concepts for an interdisciplinary analysis of irrigated settlement schemes are: *water-network* and *alignment strategies*. Alignment strategies involve conscious attempts at translation and enrolling of different elements to the network (see Callon 1980, 1986; Latour 1987). Below various types of alignment strategies that matter in the life of an irrigated settlement are conceptualised.

Upon opening the black box and finding it gone: from design to navigation

Over the last two decades a variety of new analytical perspectives have been developed that treat technological development in an interdisciplinary fashion. Two schools stand out: social construction of technology (Bijker 1987, 1993, 1995, Bijker and Law 1992, Pinch and Bijker 1984) and actor-network theory (Callon and Latour 1981, Latour 1987, Law 1994). Both schools contest the notion that technology development is just a matter of applying the right materials and natural (physical) laws, thus producing objects (technologies) for particular purposes of use. Rather they aim to open the 'black box' of the object by deconstructing the assembly of its constituent parts, the main actors involved, their different interests and perceptions, and the contingent nature of the design process. By opening the black box of the

¹ Mackay and Gillespie (1992, 686) equate technological determinism with a view that 'technological development is autonomous with respect to society; it shapes society, but is not reciprocally influenced. Rather, it exists outside society, but at the same time influences social change.'

design of the object it is shown how closure is achieved, i.e. a stage when the possible meaning and use of the object is no longer contested and its origins are ascribed to the laws of nature.

However, the resultant 'thick descriptions' often fail to go beyond the black box, but remain stuck in it, without taking note of wider socio-political ramifications (Bijker 1993, Winner 1993). The studies share a bias on the conception, invention, design and development of technology neglecting its contested use, once the technology has left the assembly line (Mackay and Gillespie 1992, 687). Many of the case studies concerned with the social construction of technology are set in specific professional and academic settings, such as laboratories, and study high-tech innovations, which are uncontested in society. Yet, irrigated settlement schemes comprise composite technologies that are amenable to change and different forms of use and affect a multitude of livelihood issues. As a result closure almost never occurs. Rather irrigation settlements are subject to continuous re-design and contested use.

Consequently a longitudinal approach towards their lives needs to be taken. Settlement schemes emerge and collapse. They employ different configurations of state and society over time: some are private, some public and some semi-public. In the lifetime of a settlement scheme these configurations are actively changed: a state operated scheme might be handed over to its users, a user operated scheme may be recaptured by the state. These changes in configuration do not come out of the blue, but are to some extent related to global and local changes in (policy) discourse. Whereas all the large-scale irrigated settlements in Africa (Gezira, Office du Niger, Mwea, and others) have been managed for a long time by state bureaucracies, they all became subjected in the 1990s to reforms that cherish the mantra of 'less state, more users, more market'. Another feature of these settlements is that the users continuously rework and reshape (parts of) the object to suit their own purposes, e.g. through breaking gates and canals, expanding irrigated command areas in drains, tapping water illegally through pipes, etc. This observation stresses the need to consider the research object as something that is dynamic, rather than static; evolving (expanding/contracting), rather than stable; shifting in sociotechnical boundaries, rather than fixed. In short what is required is *an ontology of the object that views the object as dynamic rather than static*.

Yet settlement schemes do not change continuously. Rather, periods of relative stability in time, form and space are alternated with instances of radical or gradual change. In this sense a settlement scheme shows analogies with the life of a real-life person, from conception and birth, to childhood, maturity and old age. Such a conceptualisation allows for the identification of *phases in the life of a settlement scheme*. Chambers (1969, 206) identifies three phases: 'first, pre-settlement with its political pressures and technical activities; second, settlement and organisation with an emphasis on welfare and production; and third, withdrawal, in which the centre of attention is specialisation and devolution.' These correspond wonderfully well with the 'three conceptually distinct spheres' that Mackay and Gillespie (1992, 691) propose for the analysis of technology development: i.e. (1) conception, invention, development and design, (2) marketing, and (3) appropriation by users². One may add the appropriation by frontline management staff, as is demonstrated succinctly for the case of an irrigation scheme in Mexico, where *canaleros* (gate keepers) are able to distribute the water after internalising the network (Van der Zaag 1992a, 1992b).

² For a beautiful example of such a biography of a technology in Zimbabwe, in this case the development, use and appropriation of the bench terrace, see Van der Zaag (2003).

The sea-saw of change and continuity in the life of a settlement scheme is conceptualised below by first assessing the forces of change responsible for an iterative process of (re)design and second by presenting the forces of continuity responsible for relatively stable periods of (contested) use.

Iterative design: interveners, shifts in discourse and paradigms

Social constructivist researchers have long argued that the design process of a technical artefact can be conceptualised as a negotiation process between relevant social groups, in which the artefact allows for various degrees of interpretative flexibility (Artifecto 1990, Pinch and Bijker 1984). Bijker has identified three possible configurations around technology development: one without a dominant group and associated set of vested interests; a second, in which one dominant group can insist on the definition of both the problem and appropriate solution; and a third configuration, in which many groups contest each others problem analysis and preferred solutions (Bijker 1993, 128; 1995). My argument is to extend this analysis to technology-in-use, expanding the number of relevant social groups that affect the negotiation process, to not only the originators of the scheme but also (inter)national policy makers, donor agencies and actual users.

Chambers (1969, with Moris in 1973) has distinguished three generic categories of government actors that are normally involved in conceiving, building and modifying a water-network. These navigators comprise Engineers, Agricolas and Administrators and are organised, at least within the context of the British Empire, in separate departments.³ Their disciplinary focus often dictates their drive towards the water-networks. Engineers are inclined to focus on the technical water control aspect, securing the water base and making the network water tight. Agricolas focus on the managerial control necessary to maximise production per unit of land. Finally Administrators are naturally concerned with the socio-political control over the water-network, seeking to maximise stability and settlement per unit of land. The three sets of actors often engage in a tug-of-war seeking dominance over the other to push their own agenda. Chambers (1969, 205-16) prefers to speak of a natural sequencing of dominance according to the life-phase of the settlement.⁴

Often changes in the appearance/phase of settlement schemes are precipitated by the navigators of the scheme, either in response to the emergence of a new *sociotechnical intervention model* or through the rise to dominance of a new *policy discourse* by either local or international policy makers. Such changes are often contested amongst the various epistemic communities (Haas 1997) that try to steer and control the ship. Chambers (1969, 96) notes the tug-of-war between Engineers, Agricolas and Administrators over the control and primary objective of the Mwea irrigation settlement in Kenya. Where Engineers viewed the scheme as a victory over nature, an engineering marvel with its own internal logic and inalienable integrity, to Agricolas the scheme was a government estate 'for making money, growing produce and employing labour', a process best facilitated by centralising control in the hands of the manager (Ibid., 88-90). In contrast Administrators saw the scheme as a resettlement venture to relieve pressures on neighbouring Reserves, whilst bringing development and political stability to the area. These opposing views affected the actual shape and type of relationships established by the scheme and its sociotechnical environment.

³ In the French colonial context these actors may not have been represented as separate government departments, though for instance the Office du Niger (often conceived as a state-within-the state) had separate internal departmental representation of Engineers, Administrators and Agricolas (Schreyger 1984).

⁴ In his view Engineers dominate conception and design; Administrators drive settlement; and Agricolas play a crucial role during the third phase of specialisation and devolution.

The act of inculcating a world view or sociotechnical model into a technology has been conceptualised in various ways. Notable is the concept of 'code in the technology' referring to the prescription of particular requirements for use of the technology and likelihood of the emergence of certain socio-economic effects when using the technology (emergent properties, see Mollinga and Mooij 1989, Artifacto 1990). Akrich (1992, 208) develops the notion of 'scripting'⁵ of technological objects: 'like a film script, technical objects define a framework of action together with the actors and the space in which they are supposed to act.'

The concept of *technological trajectory or paradigm* is used in studies on sociotechnical change to depict a stage in technology development when a particular configuration and technical shape becomes dominant and stabilised in (design) engineering practice (Diemer 1990, MacKenzie and Wacjman 1985, Mollinga and Mooij 1989). In irrigation studies the notion of irrigation paradigms is situated by distinguishing different (colonial) schools of irrigation engineering in both space, time and shape. Overall irrigation factories draw on similar design engineering dispositions, but their exact physical (i.e. distribution structures) and managerial (i.e. organogram of the managing agency) composition depends on the irrigation school of the design engineers and its associated model (mother) scheme. Examples of factory schemes that are inspired by prototypes that feature as models for successive schemes are Mwea and its clones in Perkerra, Bura, Ahero and Tana in Kenya; and Nyanyadzi and its clones in the Save valley in Zimbabwe (Mutema, Chakohwa, Chibwe, Devuri and Nenohwe).

The desire for stabilisation: contested use of the technology

Once the technical object leaves the factory, laboratory or design theatre a process of 'reciprocal adjustment between the technical object and its environment' starts (Akrich 1992, 207). Two fundamental questions can be raised with respect to technology-in-use: (a) how does the technical object constrain or enable actors in the way they relate to the object, i.e. structure its use; (b) to what extent are the actors able to reshape the object and the various ways in which the object may be used. Both questions relate to the issue of boundary control or *stabilisation of the object*.

Akrich (1992, 208) and Mackay and Gillespie (1992, 702) note that in the case of a composite technology, like an irrigation scheme, the link between technical choices, users' representations, and the actual uses of technology becomes fuzzy. Irrigation technology is more open than a hand-hoe, i.e. it is more amenable to being used for a range of purposes. Of particular concern in irrigated settlements that aim at transforming subsistence oriented Africans into modern producers is the process of 'configuring users', i.e. defining the identity of putative users and setting constraints upon their likely future actions (Woolgar 1991, 60-1). The success of this configuration depends on the hardness of the boundaries set by the technical object. Since the boundaries are not very hard in the case of an (irrigated) settlement scheme, the act of stabilising and controlling water, technology, and actors and the relationships between them becomes paramount.

⁵ According to Akrich (1992, 207-208) scripting technology works as follows: 'When technologists define the characteristics of their objects, they necessarily make hypotheses about the entities that make up the world into which the object is to be inserted. Designers thus define actors with specific tasks, competences, motives, aspirations, political prejudices, and the rest, and they assume that morality, technology, science and economy will evolve in particular ways. A large part of the work of innovators is that of 'inscribing' this vision of the world in the technical content of the new object.' In irrigation design, such scripting is done on the basis of design assumptions for which feasibility studies are undertaken.

Chambers (1969, 230-5) in his typology of settlement schemes thus focuses on the type and degree of (organisational) control that is exerted by the management. Ever since Wittfogel (1957) developed his thesis on the interrelationship between large scale irrigation works and bureaucratic, despotic regimes, studies of irrigation have focused on and operationalised a concept of *control*. Whilst social scientists emphasise the means of controlling people (management controlling settlers), engineers have a natural inclination to focus on the control of water flows. The fact that irrigated settlements are conscious attempts to develop human settlements through the introduction of means to control water flows, justifies a focus on forms of water control. Developing and maintaining a water-network requires the conscious operationalisation of a form of water control in all its dimensions. Three dimensions stand out: physical control over water flows by means of canals, pipes, dams, and other means; managerial control over the people operating the infrastructural devices and finally, socio-political control over the effects and modes of organisation that emerge around water use (Bolding *et al.* 1995, Mollinga 1998). The operationalisation of water control requires *technologies of water control*,⁶ i.e. sociotechnical procedures and regulations that impinge on, and enforce, prescribed practices. These technologies of control take various forms. Chambers (1969, 233) notes the enforcement by central management of sanctions that take the shape of crop payout reductions, withholding of central services (water), prosecution and eviction.

Yet, 'people are not merely malleable subjects who submit to the dictates of a technology' (Mackay and Gillespie 1992, 698). How social actors relate to technology is not self-evident, it entails a process of attributing meaning to the technology and incorporating different, new, elements to the existing portfolio of livelihood practices. Particularly in situations where irrigated settlement schemes provide radical breaks with previously established agricultural practices and production strategies, settlers move through a process of induction, adjustment, resistance, re-alignment and active appropriation, i.e. they are not passive recipients of the new technology and associated production system. The history of irrigated settlement schemes is rife with stories of settlers destructing and manipulating water distribution structures; settlers expanding the command area and changing the stipulated cropping pattern; settlers abandoning the scheme, or violently articulating their protest. To analyse the relationship between the settler and the technology/water-network and the active re-alignment this entails, I use the concepts of *counter discourses* and *strategies of (re)appropriation*. Critical in the construction of counter discourses and strategies of (re)appropriation are the sets of local dispositions that social actors have developed over time in interaction with their material and social environment (Bourdieu 1977).

Counter discourses are discursive practices that may emerge as intervention-coping strategies (De Vries 1992, 132). They entail different types of voice, not just in reaction to bureaucratic procedures regulating access to resources,⁷ 'but from a stock of local knowledge comprising a repertoire of strategies of accommodation, confrontation/resistance and manipulation' (De Vries 1992, 127). Long (1992, 25) notes that 'all societies contain within them a repertoire of different life styles, cultural forms and rationalities which members utilize in their search for order and meaning, and which they themselves play (wittingly or unwittingly) a part in affirming or restructuring.' This provides settlers and their kinsmen with a variety of cultural, religious and political repertoires to tap from in order to shape counter discourses. Notable in

⁶ The notion of technologies of (water) control is a derivative from the concept of technologies of governance, originally developed by Foucault (1977) and elaborated for policy studies by Miller and Rose (1992) and Munro (1997).

⁷ For instance labeling processes that define eligibility to the resource, e.g. conceptions on the settler.

the context of irrigated settlement schemes are traditional idioms of identity (e.g. a Chief claiming ancestral authority over land), African nationalism (e.g. young settlers opposing colonial rule), and modern Christianity (e.g. mission educated entrepreneurs desiring bigger plots). Counter discourses are not just modes of talking, they include ways of securing participation, organising voice and alternative modes of organisation.

Strategies of (re)appropriation pertain to alternative modes of organisation and the active re-alignment of constitutive elements of the water-network to suit the purposes of the users.⁸ These strategies are informed by previously existing local dispositions, most notably so in settlement schemes which engage original inhabitants (Kater *et al.* 2000, Magadlela 2000). Invariably, the original inhabitants maintain parts of their original production system. In Africa this implies that most irrigation settlers perceive irrigation as complementary to their dry land agricultural or pastoral production practices, as well as other sources of non-agricultural livelihood options (i.e. migratory labour, trading, craft making). The extent to which these practices are allowed to co-exist with the irrigated production depends on the degree of water control exerted by the scheme's management. But it is equally dependant on the scale of the scheme, its spatial and agro-ecological setting, and levels of water scarcity experienced in the scheme.⁹

RATIONALE OF PART 2: MODERNITY AND OPPOSITION

The rationale of part 2 of the thesis is two pronged. One story line is formed by the technography of Nyanyadzi irrigation scheme from its inception to the present. A concurrent story line focuses on the fruits and fallacies of Nyanyadzi scheme as a model for modernisation of African agriculture and the associated colonial policy aim of creating a loyal class of African yeoman peasants.

Nyanyadzi in the context of smallholder irrigation development in Zimbabwe

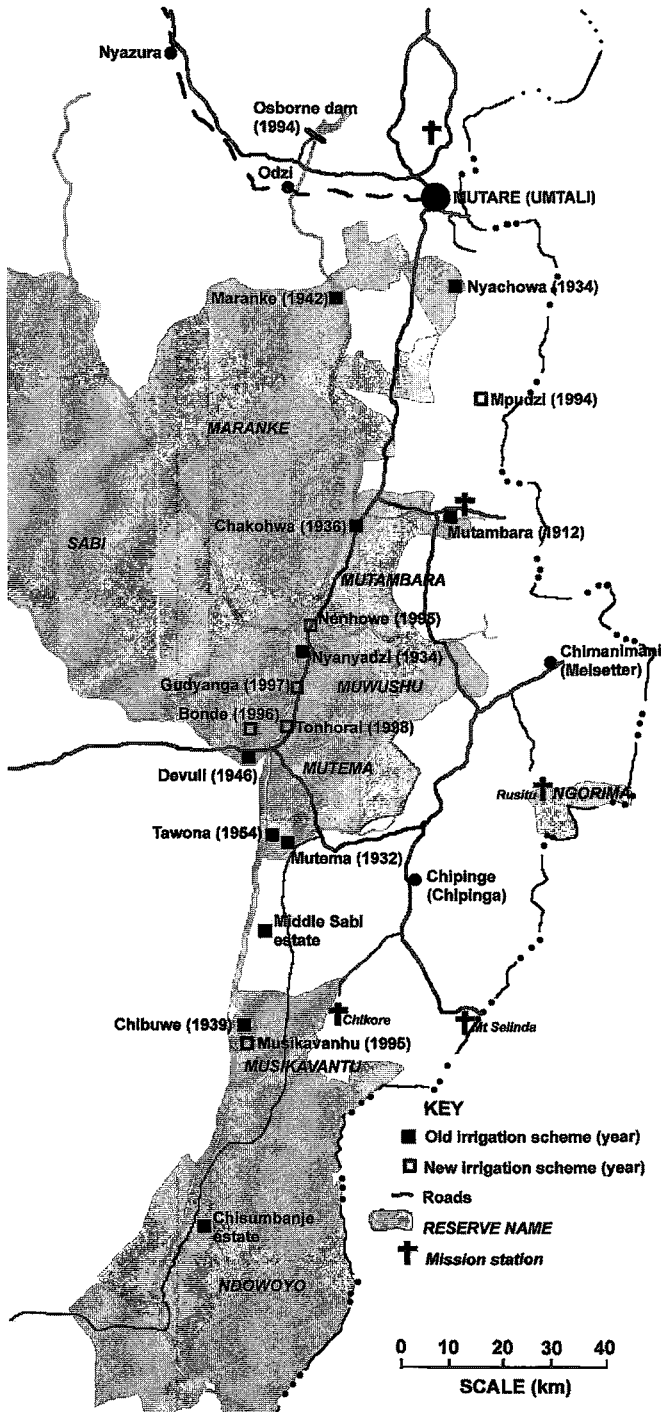
The development of the Nyanyadzi water-network broadly reflects the history of smallholder irrigation in Zimbabwe, though Nyanyadzi deviates with respect to its exceptional success¹⁰, an aura which rapidly wore off after independence. Nyanyadzi also made a name for itself as a political hotbed, a reputation that stuck after independence. Nyanyadzi provided the prototype or master model for a string of irrigation schemes that was established in the Save valley (see map i.1). Thus Nyanyadzi can be regarded as a paradigmatic scheme, reflecting state-of-the-art technology for both the gravity and pumped water-networks that were crafted in its image. Instrumental in the conception and ultimate construction of the Save valley irrigation schemes was Emery Delmond Alvord. Alvord regarded the Nyanyadzi water-network and its inhabitants as the best achievement in his career as an agricultural missionary. Nyanyadzi provided a field laboratory for new management regimes, shifts in cropping patterns and experiments on establishing rural industries.

⁸ To a certain extent this definition of strategies of appropriation overlaps with the concept of counter-discourses. However, whereas the latter involves discursive practices, the former often entails material practices as well.

⁹ These features influence a.o. whether there is excess land and water available that allow settlers to expand the command area, whether rain-fed cultivation is a feasible option in the prevailing climate, whether mutually beneficial deals can be struck with neighbouring pastoralists, whether there are urban markets in the vicinity that allow for trading goods outside official marketing channels.

¹⁰ Nyanyadzi was considered so successful that the Department of Native Agriculture financed the shooting of a propaganda movie in 1950. The movie centres on the visit of Bekapi, a traditionally dressed 'tribesman' from a destitute Reserve, to his wealthy uncle living the life of a modern African in Nyanyadzi irrigation scheme.

Map i.0.1: Save valley irrigation schemes: location and year of inception



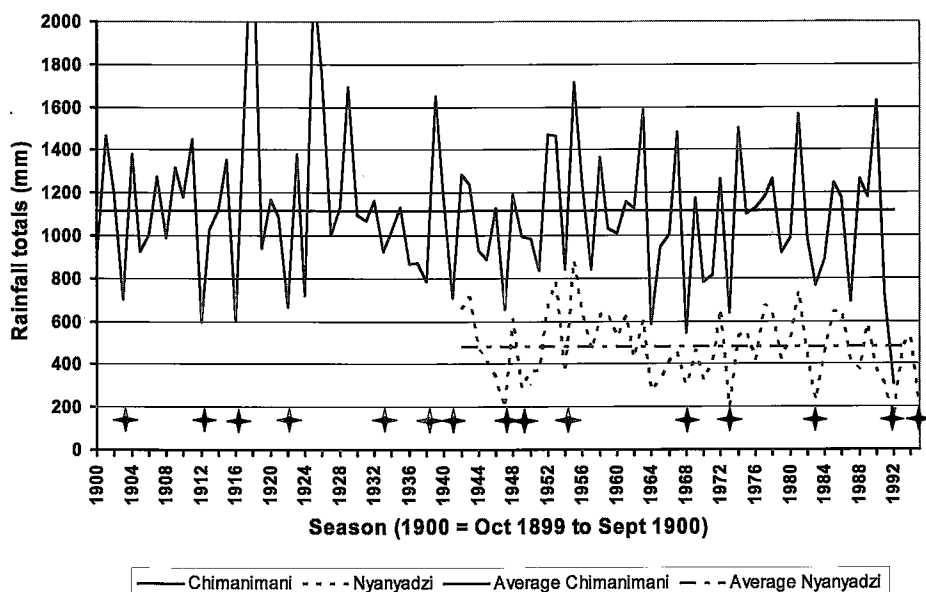
Nyanyadzi initially covered a disproportionate share of the total African irrigated command during the 1940s and 1950s, a position it could not maintain after independence (see table i.2). The presented trend in average land holdings in table i.2 reflects the shift from maximising production per unit of land, when Alvord and his Department dominated affairs (1940-1961), to maximising settlement per unit of land during the reign of the Administrators after 1967. After independence the average land holding tailed off as a result of on-going sub-division of plots amongst heirs. Nyanyadzi scheme broadly mirrors the national trend.

Table i.2: Development of smallholder irrigation and Nyanyadzi scheme in Zimbabwe

Year	Scheme (#)	Command area (ha)	Plot holders (#)	Avg plot holding (ha)	Nyanyadzi command area (ha)	% of total	plotholders (#)	Avg plot holding (ha)
1940	8	436	?	?	114	26	107	1.1
1951	7	931	814	1.1	297	32	277	1.1
1961	12	1899	1369	1.4	312	16	278	1.1
1972	54	4026	4412	0.9	391	10	391	1.0
1983	72	4269	5825	0.7	414	10	451	0.9
1991	70	4775	7900	0.6	414	9	451	0.9
1997	300	10000	20865	0.5	414 (430) ¹¹	4	458 (752) ¹¹	0.9 (0.6) ¹¹

Sources: 1940: NAZ, S2814/3586b; 1951 & 1961: annual reports Department of Native Agriculture; 1972: Hughes (1974); 1983: DERUDE (1983); 1991: Rukuni and Makadho (1994); 1997: GoZ (1997).

Graph i.1: Rainfall record and droughts in Nyanyadzi, 1900-1995



The Nyanyadzi water-network has suffered from recurrent water scarcities caused by drought conditions. Right from the start, the capricious behaviour of water inspired the network builders to improve the network, either by adding new elements (dam, pumps) to mobilise more water or else by reordering the mode of management to economise on the use of

¹¹ These are estimates based on a survey of *de facto* plot sizes and plot holders in Nyanyadzi scheme in June-July 1997

available water. Graph i.1 provides an overview of the available annual rainfall totals for Chimanimani (representing the upper catchment area) and Nyanyadzi itself. Major drought years are indicated with a star. Before the onset of the irrigation scheme these drought years marked the occurrence of famines.¹²

The paradox of African irrigation and (nationalist) opposition

Paradoxically, the wealth generated in Nyanyadzi and other irrigation schemes as well as the political promises and faction fighting amongst the different anti-colonial movements, invoked dissent and opposition rather than loyalty and support for both the pre- and post-independence government. The nature of the opposition is captured in three paradoxes, presented below in chronological order.

Paradox 1: From singing the British national anthem to dissident nationalism

'We held the official opening of this canal on 1st October 1937, just six months after having cut our way through thick bush. The Native Commissioner of the District assisted by the Superintendent of the American Methodist Mutambara Mission opened the headgate promptly at 12 noon, while nearly 1,200 Africans sang "I She Kungurira Africa" (God care for Africa) and ended with "God save the King", then cheered in great excitement as the wave of water started down the canal.' (Alvord in his autobiography on the opening of the Nyanyadzi South bank canal, n.d.)

'[A]t Nyanyadzi we have found more dissident, frothy-mouthed nationalistic politicians than in most other parts of rural Rhodesia.' (Report of District Commissioner for Melsetter district, 17 April 1969)

These two observations, separated by 32 years, both reflect on Nyanyadzi irrigation scheme. The statements contain a mystery, a dream that is shattered, or at least a paradox. Within the life-time of a generation loyal African subjects of a part of the British Empire have turned their backs on their benefactors. The mystery deepens when one realises that both a government economist in 1958 (Hunt) and an independent American researcher in 1962 (Roder 1965) found that the average irrigating plot holder in Nyanyadzi accumulated twice as much money and wealth as his/her African counterpart in dry land farming. Ranger (1985) observes that state interventions prohibiting Africans to pursue the 'peasant option' formed the root cause for 'peasant consciousness and guerrilla war'. The crowding of the African population in agriculturally marginal areas and subsequent policies of forced destocking, enforced contour ridging and limitation of arable land holdings, had resulted in few opportunities for survival on the basis of agriculture alone. Why then did African nationalism thrive in a place like Nyanyadzi, where the 'peasant option' was real and rewarding? This is one of the central questions of the second part of the thesis.

Paradox 2: From a show-place to a non-starter

'Nyanyadzi is regarded as something of a showplace by the Rhodesian government.' (Roder 1965, 14)

'The politicians and the attitude of the Nyanyadzi irrigators obstruct my work (...) I am only sitting back now. I recently found out that Nyanyadzi is one of the most problematic schemes in the country. It is the attitude of the local irrigators. As an officer you try to do well for your people, but if it is not appreciated, well (...) I am tired of doing all these things for their development (...) I noticed that the irrigation manager for Nyanyadzi in the past always organised a transfer after say six months in the

¹² Major (countrywide) famines were experienced in 1903, 1912, 1916, 1922, and 1947. The droughts of 1933, 1938 and 1941 were more local in nature and only caused famine in the arid Save valley.

post. That is because after six months you start to get irritated. It becomes unbearable'. (personal communication, Irrigation Manager Nyanyadzi, 15 November 1995)

In the late 1950s and early 1960s Nyanyadzi irrigation scheme was paraded as one of the most successful government interventions in terms of agricultural production, wealth and modernisation of African society. Thirty years on, Nyanyadzi was considered by government officials as one of the most difficult places to work, a 'non-starter'. Resident Agricolos bemoaned the fact that Nyanyadzi had succumbed from a place for commercial agricultural production to a place where people merely survived and used the scheme for subsistence purposes only. In their view Nyanyadzi had completed a full circle, from a venture securing the basis of survival in a famine prone area, to an island of commercial agriculture, and back again. The hand out of drought relief packs to Nyanyadzi plot holders in 1996 only seemed to confirm this trend. Another feature of the Nyanyadzi community, yielding disapproval in government circles, was the political jockeying and general climate of resistance officials encountered during their attempts to improve the scheme. This feature was ascribed by some to the predominantly *Ndau* origins of the Nyanyadzi community: the *Ndaus* being known for their stubbornness and own ways of doing things. Such characterisations obscure the political nature of the opposition to government interventions in Nyanyadzi. As the succeeding chapters will show, the roots of resistance have been nurtured and informed by past interventions, nationalist promises, and political splits that occurred during the war of independence.

Paradox 3: Internally divided, but united against the government

'They uttered bad words against government. That they are not going to vote in favour of the government in the coming election (...) That the whole staff must be removed from the scheme and remain communal. That they will make a follow up to the President. That they have declared war with the oppressors'. (Report from the Irrigation Manager for Nyanyadzi on the response of the plot holders to an announced inspection of their plots and payment records, 18 October 1989).

'Suddenly an old man rises and demands to know: 'Where is the money for the co-op?'. The chairman of the Nyanyadzi co-operative mutters some explanation, which drowns in the general upheaval now besetting the meeting. One IMC member shouts people do not meet anymore for co-op matters: they don't pitch up. Then another old man, an ex-chairman of the co-op, rises and explains he called for a general meeting long back: 'I want to be able to explain why I resigned'. Somebody shouts: 'You are wasting our time!'. Another IMC member shouts: 'We want to catch the culprits! Let's get Mugombi, the vice-chairman, he took the moneys!'. The meeting slowly degenerates into a brawl, the chairman no longer controls the proceedings. Two old men stand opposite each other. 'You never called for that meeting! You lie!'. The other man smiles, and responds: 'No, you lie.'.' (General meeting of Nyanyadzi plot holders with the Irrigation Management Committee to discuss the problems of water distribution, 24 May 1995).

Many meetings between the Agritex management, Irrigation Management Committee (IMC) and the general public ended in wild brawls where old men accused each other of all sorts of wrong-doings and pushing of private political agendas. Yet, whenever the Agritex management tried to impose an unpopular measure, they were castigated by all, including the district, provincial and national ZANU(PF) leadership. Whilst the management legitimised its presence by pointing at the political divisions within the Nyanyadzi community, the latter mobilised a variety of counter-discourses denouncing the government and Agritex in particular. The origins of these counter-discourses and the divided nature of the Nyanyadzi community have to be placed in the historical context of the modernisation model promoted by Alvord, and the nationalist politics that sprang forth from it.

Chapter outline

Chapters four and five present Nyanyadzi's emergence and stabilisation as a factory scheme. Four successive phases can be discerned: (1) Alvord's dream and failed pilot scheme; (2) settlement of the big scheme under Alvord's guidance; (3) attempts by Agricolos to refine production; (4) Administrators in a beleaguered factory scheme trying to stamp out nationalist inspired resistance. Chapter six discusses post-independence attempts to define a new irrigation management policy, which was at odds with the desire by local management staff to revive centralised managerial control. Lacking political and financial clout, the management embarked on a process of hand-over of the scheme to the users by default, during the mid-1990s. Chapter seven more explicitly presents the counter-discourses and strategies of re-appropriation that various Nyanyadzi users developed over time. By identifying two cross-generational strategies of accumulation a new light is shed on user-based modes of (re)ordering and (re)appropriating the scheme. Combined with a third, politically informed, strategy of re-appropriation, three alternative modes of user based organisation have emerged at Nyanyadzi. The modalities, strengths and weaknesses of these three modes are presented in chapter eight.

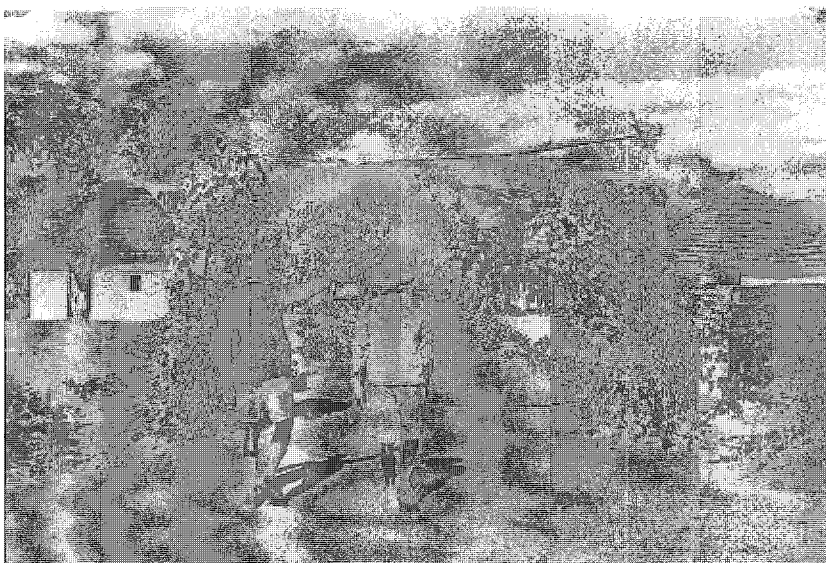


Photo 6: Aaron shows Bekapi around the model village at Nyanyadzi, 1950
(Source: National Archives of Zimbabwe, photo collection no.22362)

THE DREAM:

NYANYADZI PROJECT AS THE MODEL OF MODERNISATION

Like many a scheme, Nyanyadzi was conceived in a dream. Alvord had just received his letter of appointment as Agriculturist for Natives, and was expected to assume duty on the 1st of October 1926. Before sunrise on the 26th of September Alvord and his African servant left Mount Selinda mission for Salisbury on a motorcycle with sidecar. They travelled on the recently constructed road, a mere track, in the hot and arid Save valley, across three Reserves along the edges of large belts of almost flat, riverside alluvial soil.

'The road crossed several strong flowing, perennial streams coming down from the Melsetter highlands, where the annual rainfall was up to 80 inches and I thought, - "What a waste of wealth!" As I camped for lunch, under a large tree on the bank of the Nyanyadzi River, at the north end of a fertile alluvium area belt of several hundred acres, I told my Native servant (...) that in a few year's time all this land would be under luxuriant crops grown with irrigation and hundreds of prosperous Native families would be living here. He looked at me in alarm, thinking I had suffered a heat stroke in the hot valley, then remarked, - "Wa rota! Akuna mvura pano!" (You are dreaming! There is no rain here!). I told him he would one day see that dream come true.' (Alvord n.d., 28; 1958, 12)

In this chapter the realisation of the dream resulting in the establishment of Nyanyadzi irrigation scheme is presented, making use of the basic tenets of a technography (see *intermezzo*).

4.1 ALVORD'S DREAM: THE SMALL NYANYADZI PROJECT (1926-1942)

Over time the story of Alvord's dream has become part of the cultural repertoire available to Nyanyadzi residents. Some claim Alvord revealed his dream to a local resident, others claim he stayed the night at Nyanyadzi river, all know the famous *muchu* tree where Alvord purportedly took his rest. How the dream became a scheme is also subject to various interpretations, some of which are presented below.

A first attempt at realising the dream: MuNyanyadzi furrow (1934-42)

The year 1933-34 was another year of famine in the Save valley. In July 1934 Alvord toured the Save valley to identifying suitable locations for the establishment of irrigation schemes, as a means to save future government expenditure on famine relief. Of the proposed locations the furrow on the northern bank of the Nyanyadzi river proved most promising, comprising a small venture, which could be expanded in future.ⁱ The fact that there were some savings on the government grant allocated for the construction of Mutema irrigation furrow, provided an opportunity to act quickly.ⁱⁱ More or less by accident Alvord met the assistant Native Commissioner (aNC) at the Nyanyadzi river halt. The aNC had just established a grain depot there for famine relief work. He was 'very enthusiastic' about the irrigation project and agreed that local Africans could be turned out at once to dig the furrow in exchange for food. According to Alvord the local people were also 'very enthusiastic' and would 'turn out in

large numbers'.ⁱⁱⁱ In his autobiography Alvord relates on the ensuing construction of the *MuNyanyadzi* furrow as follows:

'Food supplies and tools were dispatched and Alvord went down to survey the furrow and start them on the job. Upon arrival, he found that all able-bodied men had gone to seek work to earn money with which to buy food. Only women and children were left in the kraals. These people, in an advanced state of semi-starvation, eagerly agreed to work for food. So, 26 women and 3 old grandfathers, working with picks and shovels, dug the main furrow to a width of 3 feet, a depth of 18 inches and a length of 600 yards. Then, while Alvord and the old men and some of the women put in the weir and headgate, the rest of them cleared the lands and got them ready for planting. In early October, 29 acres in one-acre plots were planted to maize. When the men returned home at the end of the year, they found that their abandoned wives and children were well fed and healthy with more food than they could possibly buy with the money they had earned. The average yield from these 29 plots was 14.5 bags per acre (3.2 t/ha, AB).'' (Alvord 1958, 25)

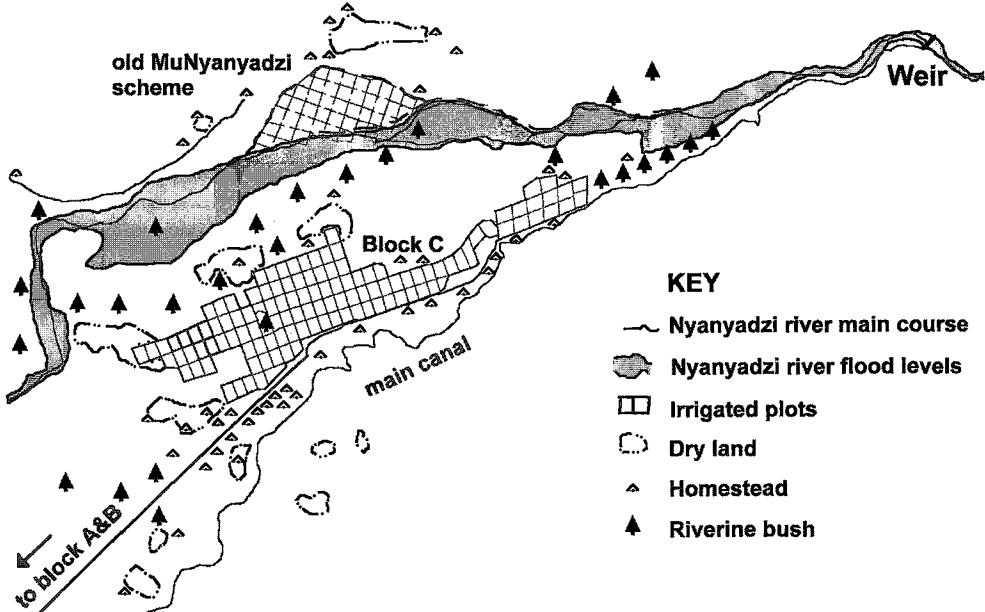
Records left by Alvord and supervisor Sigauke in the archives as well as eyewitness accounts suggest a less smooth run of affairs. First of all Alvord had to convince the Nyanyadzi people of the benefits of irrigation. To do just that Alvord had to go at great lengths. By walking on his hands Alvord tried to show that there was more than one view on the world. At another meeting Alvord was dressed up like a woman, his hair painted purple, sitting on the ground with other women.^{iv} Alvord negotiated profusely with local kraalheads. Some were in favour, having experienced the benefits of working with missionaries in their career as labour migrants.^v Others purportedly fled, afraid of the heavy work that irrigation entailed^{vi} or suspecting some scheme of the whiteman to test the land before taking it away.^{vii} The brother of a present (female) kraalhead, governing the other, southern, side of Nyanyadzi river, was given silver coins and a big cloth by Alvord. By throwing the coins in the river, permission was begotten from the water spirits residing in the river to open the furrow.^{viii}

The initial process of constructing the furrow was fraught with setbacks. An inspecting engineer from the Irrigation Department stipulated that one section of the furrow had to be lined with pig wired cement, to prevent excessive seepage of water.^{ix} By September 1934, some twenty one men and eight women were working on the furrow, in exchange for free food rations and one pound tax restitution. Only eight men were tax defaulters, the others were paid the equivalent of their tax in maize rations (amounting to 1.25 bags per person). After three weeks half the furrow had been completed. Alvord suggested a water right application should be handed in to the Water Court, stating erroneously that since the Nyanyadzi river was entirely situated in Reserve land, no European farms would be affected by the water withdrawal.^x In July 1935 the resident supervisor (Sigauke, see box 3.1) requested the aNC for eight workers with food rations to finish work on the lateral furrows, which had to be cut through thick riverine bush. Sigauke required these workers, since he was of the opinion that the local people often ducked their responsibility. Sigauke was 'tired of talking to these lazy people.' Possibly their reluctance had to do with the sudden death of a certain man called Manzini. The latter had volunteered to work on the furrow, but after reaping his first maize crop, had inexplicably died.^{xi}

By December 1935, some plots had been cleared of bush and stumps and a maize crop put in. However, the river weir leaked so badly that insufficient water entered the furrow.^{xii} Alvord soon found out that the lined canal section was situated at a high elevation, prohibiting water to reach the plots. Despite the purported enthusiasm of the plot owners, Alvord called for a messenger of the aNC to come down to the scheme and mobilise the plot holders to take out the lined section and replace it with new cement lining at greater depth.^{xiii} From an attached list of plot owners it transpires that the scheme comprised 36 acres (14.5 ha) split amongst 29

plot owners. The resident demonstrator was entitled to three irrigated acres, four local kraalheads and supervisor Sigauke had two acres each¹, and 23 Africans had one acre. In March 1936 supervisor Sigauke was still struggling with the leaking weir, propping it up with bush and sand to divert sufficient water to the standing crop.^{xiv}

Map 4.1: Nyanyadzi irrigation scheme, block C, in 1950 (showing old MuNyanyadzi scheme)



How was this emerging water-network functioning in the face of unco-operative trees, seeping soils, reluctant plot owners and a leaking off-take? In what sense did it deviate from existing practices of mobilising water for crop production? In Alvord's hindsight narrative, the MuNyanyadzi furrow was a success. Besides the bumper harvest of maize in its first season of operation, the plot owners had harvested a crop of beans in April 1935 and a crop of wheat in August (Alvord 1958, 28). In addition to the plot holders and their families another 90 people had flocked towards the scheme, fleeing from famine. Purportedly at the request of these people Alvord embarked on the large canal on the southern bank of Nyanyadzi river, to irrigate the vast stretch of flat alluvial lands that had precipitated his day-dream (Ibid., 31).

In historical narratives of local Nyanyadzi actors, the new scheme presented less of a radical break with existing water use practices than Alvord portrayed. The original inhabitants already lived along the fringes of the river, growing early maize in wetland gardens, a practice known as *matoro*.^{xv} The present kraalhead on the southern bank of the river recalled that some people had already transformed this small scale practice of cultivating in wet places, into some form of irrigation, leading water from the river along an extensive network of narrow furrows (or ridges). This form of wetland cultivation was undertaken in complement to, rather than in competition with, dry land cultivation in the rainy season, as was also the case for the MuNyanyadzi scheme plot owners.^{xvi} The only difference that the

¹ Traditional leaders were allocated two acres of irrigated land in regard to their ascribed obligation as guardians of their community to provide free food for the needy during times of famine.

scheme presented was its sheer span, both physical, social and temporal (extending the growing season), as well as its rectangular shape (square acre plots, straight lateral furrows, *vide* map 4.1) and material features (lining and weir structure). The scheme also differed in requiring collective action, i.e. the mobilisation of labour for maintenance activities and some form of co-ordinated approach towards water distribution. These collective activities were initiated and supervised by the local demonstrator. However, the crops to be grown under irrigation were not dictated by this government agent.^{xvii} Only after 1936, when Alvord had drafted a policy on community irrigation schemes (see box 4.1), MuNyanyadzi furrow became known as a government scheme. This change required the plot owners to pay five shillings per acre annually towards the upkeep of the scheme, whilst their labour obligations towards the scheme were limited to emergency repairs only.

Box 4.1: Policy on community irrigation schemes (1936)

Initially the onus of developing irrigation schemes for Africans laid in the hands of Missionaries and well-meaning Native Commissioners (Roder 1965). In 1928, the NC Chipinga enrolled Alvord in his capacity of Agriculturist for Natives in efforts to construct an irrigation furrow in the arid Mutema Reserve. Thus Mutema became the first government scheme, operational in 1932. However, Alvord refrained from getting involved with existing African schemes like Mutambara (1912) or new schemes initiated by other NCs like Nyachowa in the Vumba Highlands (1933). The reason for this restraint was that these schemes were situated in well-watered areas that did not normally require irrigated agriculture as a means of famine protection. In 1936 Alvord formulated a policy on community irrigation schemes in response to two events. Firstly, it had been decided that plot owners in government irrigation schemes would have to pay annual water rents to provide for their upkeep. Secondly, both Mutambara and Nyachowa schemes had been improved and their plots contour ridged, so as to enable them to function independent of further government assistance.

The private (community) schemes were conceived as water furrow companies, composed of shareholders who either contributed labour during construction of the furrow or alternatively paid for the use of water at a nominal rate per annum. A furrow committee made up of the resident headman and other elected members managed the company and scheme. The Native Commissioner acted as both president and treasurer of the furrow committee. A resident demonstrator acted as technical advisor and through him the NC could 'issue orders and instructions to be carried out by the shareholders.' All shareholders were responsible for repair work and maintenance of the furrow, of which a record was kept by the demonstrator.^{xviii} However, after fierce criticism on the wasteful methods of irrigation employed on the schemes and the dogged refusal of Mutambara plot holders to comply with any of the NC's orders, Alvord started to have second thoughts on the desirability of African managed schemes. Discussing a new cost recovery policy for government schemes, Alvord suggested to establish departmental control over both Nyachowa and Mutambara scheme through the newly appointed European irrigation supervisor, in 1939.^{xix}

In Mutambara this move triggered further resistance by the scheme's owners, as voiced in a letter of complaint. In the letter the Mutambara irrigators complained they were now 'being taxed on our own foresight and initiative. (...) We do insist that our prior rights should be guarded and reserved to us. (...) We look to the Government as our father and only ask for a square deal.'^{xx} Lacking a square deal, the Mutambara people, led by their Chief, continued to resist government interventions, ultimately leading to closure of the scheme in 1974 (see Manzungu 1995, 1999). In contrast, Nyachowa scheme was allowed to continue as a private scheme, since it was only used during winter seasons to grow 'luxury crops such as wheat.' Alvord ruled that any irrigation furrows in areas 'where rainfall is above 25 inches (635 mm) per annum' should not be maintained by his department.^{xxi}

However, over time MuNyanyadzi furrow proved not very durable. Basically it was Nyanyadzi river water that kept on throwing spanners in the wheel. Whilst the scheme was fenced off and slowly expanded to cover a peak span of 48 acres (19.4 ha) in 1940, the river

obstinately refused to co-operate. After delaying the 1938/39 growing season by providing too little water, a subsequent flood of water flushed out the weir and lowered the riverbed. In response the head gate and furrow were (again) deepened, and a new weir put in the river. But then during the 1939/40 rainy season the river current shifted to the bed on the opposite side of the intake. Now the riverbed, close to the intake, was deepened. In October 1940 the plot owners were forcibly turned out to build a new weir across the vastly widened riverbed, in an effort to divert the flow of both river currents into their furrow.^{xxii} But then in the 1940/41 rainy season the river once more diverted its course, this time towards the furrow itself, flushing out the top end stretch. The aNC now started to express doubts on the viability of the scheme, recommending to take out water by means of an engine and centrifugal pump, instead of repairing the weir and main furrow.^{xxiii} Alvord discarded these plans as too expensive, and once again set out to repair the main furrow and weir. Finally, during an unprecedented flood² in February 1942 the whole furrow, headworks and some five acres of standing maize was washed away, and the scheme was abandoned. In 1943 the majority of plot owners were shifted to the other side of the river, and accommodated in the newly opened up block C of the big Nyanyadzi scheme.

Conclusion: learning from a network failure

Alvord was unperturbed by the failure of the MuNyanyadzi water-network. In his obituary of the venture, Alvord stressed the scheme had cost the government only £86 in construction and repair costs, a cash outlay which had been amply compensated by the food security (and famine relief savings) offered by the scheme's grain output.^{xxiv} He also expressed the hope to take up the remaining 40 acres of irrigable land in some future scheme.³ In a way MuNyanyadzi scheme had provided Alvord and his staff a valuable learning experience, or testing ground, for the other schemes in the Save valley, like the big Nyanyadzi scheme.

The particular mode of ordering the constituent elements of the scheme proved unsustainable. Whilst the scheme was conceived and run within the period that Roder (1965) labels as irrigation development under 'African control', it necessitated more sophisticated forms of water control than applied by Alvord and his team. Alvord had no knowledge of the river, and its behaviour. He overestimated the scheme's command area (200 acres), and underestimated the power of the water (floods). Roder (1965, 112-4) observed this tendency, of overestimating physical control over water, in all of the nine Save valley irrigation projects initiated by Alvord. The very span of the scheme further necessitated some form of managerial control. When it proved difficult to turn out plot owners to provide labour for the repair of the ailing network, Alvord felt compelled to assume control by instituting annual water rent payments. The money thus generated was kept by the aNC in a furrow

² The intensity of the floods was unprecedented. One rain gauge recorded 330 mm of rainfall in one night. Besides the MuNyanyadzi scheme, two floodwater schemes in the Save valley were destroyed, as well as the upper Mutema furrow including 40 acres of crops (Alvord 1958, 35).

³ It was only after 40 years of barren existence that the stretch of land previously known as MuNyanyadzi scheme was irrigated again. Thus Alvord's hope was fulfilled, but not by the then independent government of Zimbabwe. It was John Mhare and his son, together with three other dry land farmers from neighbouring Nemaramba, who dug a new furrow during the drought of the 1983/84 season. By 1997 the five users irrigated some 7 acres of land. They used the irrigated production in complement to their dry land production. In the scheme they were growing maize and sorghum in summer and tomatoes, beans and wheat during the winter season. Their scheme does not comprise square fields, lined furrow sections, or a permanent weir in the river. Rather their irrigation enterprise is dynamic, expanding during wet years and shrinking in dry years. Yet their farmer initiated irrigation furrow (see chapter 9) was still operational some fifteen years after its opening, outlasting its predecessor. Furthermore along the fringes of the river, the offspring of the original MuNyanyadzi owners were operating small, bucket-irrigated gardens (see chapter 7, Map 7.1).

maintenance fund. Since the basic goal of the scheme was to produce grain for food security purposes and famine mitigation, no control over cropping patterns or socio-political development of the scheme's users was sought. This changed in the case of the big Nyanyadzi scheme. The sheer span of that scheme, added to a realisation on the part of Alvord that this new scheme offered real opportunities to realise his vision of a modern, prosperous, agrarian based African community, resulted over time in considerable refinement of water control in all its dimensions.

4.2 ALVORD'S DREAM: THE BIG NYANYADZI PROJECT (1937-45)

Feeble beginnings, strong doubts (1937-39)

After constructing another small irrigation scheme along the Umvumvumu river (Chakohwa) in 1936, Alvord turned his attention to the big scheme on the Nyanyadzi South bank in 1937. Investigations by Alvord himself and the irrigation engineer promised this project, the largest so far undertaken, also to be 'without question, the most economical and most worthwhile' of all Save Valley schemes. The alluvial flat stretch of soil was deemed to be the 'richest and most fertile soil to be found in Rhodesia' and some 4,000 acres (1,680 ha) in extent. The command area of the scheme was only limited by the supply of water from the Nyanyadzi river. Optimistically, Alvord applied for a water right to irrigate some 2,000 acres in summer and 1,000 acres in winter, enough to settle some 1,000 families, at an estimated construction cost of only £1,200.^{xxv} However, to bring the water to the alluvial land, a furrow had to be dug and blasted through some seven kilometres of bush, sand and rock outcrop. The work on the main furrow started on April 1st, 1937. Some 230 Africans, mostly in tax arrears with the government after having taken famine relief grain, worked on the furrow with picks and shovels. On Coronation day some 60 charges of dynamite were fired off to blast a way through a solid granite *kopje* (Alvord 1958, 31). Within six months, the first water was entering the furrow.

Over the next few years the project became subject to official criticism and doubts of various types. It was a matter of days after the furrow had been opened, that the aNC for Melsetter district sent an alarming cable to the Chief Native Commissioner (CNC) talking of large areas being flooded by the Nyanyadzi water thus released, causing damage to both the main Chipinga-Umtali road and soils.^{xxvi} Alvord re-assured the CNC that some water had spilled onto the road by way of an old elephant wallow. Water had been under control at all times and drains were being dug to protect the road.^{xxvii} In 1938, another challenge was raised by the Soil Conservation Officer, who deemed the methods of water distribution employed on irrigation projects (uncontrolled flooding from a lateral furrow) wasteful and damaging to the soil. Yet another irrigation engineer commented disapprovingly on mud puddled and swamped plots in Nyanyadzi. Palmer, Alvord's European assistant, responded to this criticism by pointing out that not all plots had been levelled yet. Moreover, the Africans engaged on the project were deemed to be 'some of the most backward we have in the country', requiring a lot of teaching. Palmer attributed the failure of the first crop to bad irrigation habits practised on European farms in the Melsetter Highlands, which the Africans had copied.^{xxviii} Alvord concurred and claimed the wasteful irrigation methods were only employed on irrigation schemes that were not under his, but under African, control (i.e. Mutambara and Nyachowa).^{xxix} However, to achieve success in future, Alvord argued for the appointment of a European irrigation supervisor to direct proper layout and preparation of plots by inexperienced plot holders.^{xxx}

The growth of the Nyanyadzi water-network was further constrained by elements that refused to co-operate, like water, trees and prospective irrigators. In October 1938 Nyanyadzi river flow had dropped to a mere trickle of water. When next a British South Africa Police (BSAP) trooper discovered some African irrigation furrows upstream, tapping the very water that was earmarked for the Nyanyadzi project, Alvord ordered them to be closed and their owners transferred to the project to do proper irrigation under government supervision (see chapter 9). The main problem obstructing expansion of the scheme was the thick riverine bush along the river (see box 3.2). Prospective plot holders were reluctant to clear this bush, since it involved hard work. In July 1939, the canal network had been expanded, but many plot holders were irrigating only partially cleared plots. Palmer threatened to withhold water from plot holders who had not fully destumped⁴ their plots.^{xxxii}

Many plot holders resented the arduous work on the irrigation plots, preferring to grow crops on their own terms, at a time of their own preference. Such at least transpired during the aftermath of the 1938/39 growing season, when a 'serious situation had developed in Nyanyadzi'. When heavy rains fell at the start of the summer season, 'most of the plot holders flocked to outside lands, many going up country into the hills. They hurriedly scratched over the land with hoes and planted *munga*. As a result they reaped a good crop of *munga* this year. They are now spending all their time in beer drinking orgies from beer brewed from this *munga*.' During the ensuing winter season 152 acres of irrigated land were planted to wheat. This crop grew into 'some of the finest wheat ever grown in this country.' The crop was ready to be cut by the end of July, but in spite of repeated orders by the aNC, demonstrator, assistant Agriculturist and Alvord himself; it was still uncut by October 1939. Meanwhile, rats, field mice, birds and locusts had had a field day. An estimated 50% of the crop was destroyed, due to the plot holders' alleged 'slovenly laziness and greed for beer.' To prevent a repeat performance of this 'fiasco', an infuriated Alvord recommended to centralise the Reserve, declaring all lands east of the Chipinga-Umtali road as grazing land. Furthermore, all plot holders had either to reside in one of the village sites on the project or else appoint a responsible person in charge of the plot.^{xxxiii}

The first comprehensive irrigation policy, 1939

Towards the end of 1939, the above events as well as a number of other pressures, resulted in a concerted effort to devise an irrigation policy, which revolved around the key concepts of European supervision, cost recovery and departmental control over irrigation schemes.

An audit report of the Native Reserves Fund, which had so far been used to finance development of African irrigation schemes, pressed for a uniform policy of water rent payments on the schemes. Alvord advocated a differentiated approach since each scheme had its own history of construction, involving either paid or voluntary labour. Yet he did favour departmental control over all private (2) and government schemes (5), concentrated in the hands of a newly appointed European Irrigation Supervisor. Continued expansion of the schemes plus routine maintenance necessitated the employment of a permanent labour gang of 10 to 15 men under the authority of the Irrigation Supervisor.^{xxxiii} The CNC insisted on some form of cost recovery, i.e. financial contribution towards maintenance by plot holders, in order to prevent a few irrigators becoming the sole benefactors of the Native Reserves Fund. The CNC also observed that since the irrigation schemes were located in Reserve land, no legal basis existed to issue leases of land to occupants. Rather, by accepting a plot, Africans would tacitly agree to make a contribution towards the cost of water supply, failure

⁴ Destumping involves the removal of tree stumps from fields.

of which would result in eviction from the plot.^{xxxiv} Regarding the size of plot allocations Alvord advocated a maximum allowable plot size, to prevent the emergence of a class of irrigating landlords. Based on the policy of arable land allocations in centralised Reserves, and in view of the fact that irrigation allowed the cultivation of two crops per annum, Alvord advocated to issue half the amount of land in irrigation schemes, i.e. three acres for each adult man, one acre for each wife, and one acre for each adult dependant.^{xxxv}

A wrangle with the aNC made Alvord put the rules of plot allocation on paper. The wrangle concerned a 'boy' of a certain Mr Hunt, who had expressed interest in buying vegetables from Nyanyadzi scheme. The boy had been referred to the local demonstrator, who promptly issued a plot to him, to grow the vegetables himself. The aNC was infuriated since he acted on the understanding that Africans from outside his sub-district could not qualify for irrigation plots in Nyanyadzi. Alvord pressed for as many plot holders as possible, and since Melsetter Africans had not been 'forthcoming', Africans from 'anywhere in Rhodesia' were to be encouraged to take up plots.^{xxxvi} Alvord's eagerness to get the project filled was informed by a recent judgement of the Water Court, declining to issue water rights to the new Musikavanhu irrigation scheme, until such time as the existing irrigation projects had been fully occupied.

The irrigation policy drafted by Alvord (box 4.2) addressed issues of plot allocation, cost recovery, enforcement of good farming methods, soil conservation and furrow maintenance. The secretary for Native Affairs suggested to give the policy some legal backing by issuing departmental instructions to NCs, whom he deemed to have sufficient powers of enforcement under the Native Affairs Act (1927). Such authority was considered essential to evict non-complying tenants.^{xxxvii}

Box 4.2: The first comprehensive irrigation policy (1939)^{xxxviii}

The policy drafted by Alvord in August 1939 was adopted in October of the same year and reads like a crude precursor to the strict 1970 Control of Irrigable Areas Regulations. The policy contained instructions on the allocation, occupation and preservation of plots on irrigation projects in Reserves. The key elements were the conditions of occupation, allotment of plots and keeping of accounts.

Conditions of occupation: A contribution to the maintenance of the irrigation works was to be paid in July of each year. The cultivation of the actual plots was to be done by observing the following five obligations:

- take out all trees or stumps;
- preserve and improve the plot's fertility by practising good tillage methods, correct methods of water application and the use of manure and crop rotations;
- furnish returns of crops (yield information) to the Agriculturist;
- maintain lateral furrow bordering the plot;
- protect lands liable to deterioration by soil erosion.

Allotment of plots: The Native Commissioner decides on the eligibility of applicants for plots, and allocates actual plots at the advice of the Agriculturist or his representative (read demonstrator, later the Land Development Officer). The Agriculturist shall number the plots and provide overview charts to the NC. The maximum plot sizes were set at 2 acres (0.8 ha) for a single tax-paying male and 4 acres (1.6 ha) to a married man.

Project accounts: The rate of the water rents due were set by the Agriculturist, and if needed arbitrated by the CNC. It was the responsibility of the local NC to collect the amounts due, keep the project accounts and expend funds at the advice of the Agriculturist. A separate bank account was to be opened for each project (the so-called furrow maintenance fund).

The scheme under duress (1940-1943)

With further expansion of the irrigation network in the Save valley on hold, and the irrigation policy in the bag, Alvord and his men now had to turn the existing irrigation projects into a success. In 1940, the newly appointed European irrigation supervisor ran a staff of one irrigation supervisor, two agricultural demonstrators, and an expanded maintenance gang, all based in Nyanyadzi to manage, maintain and expand irrigation operations in Mutambara, Chakohwa and both Nyanyadzi schemes. A local policeman (Chiwata) was responsible for keeping illegal water abstractions in check. The key to success for Alvord and his men was to turn the largely empty, nascent Nyanyadzi water-network into an attractive and viable proposition for African plot holders. In practice this meant a suitable crop and market had to be found, whilst doubtful, stingy Administrators had to be kept at bay. At the same time, additional (human and financial) resources had to be mobilised to expand the schemes to their full capacity. The year 1942, with its destructive floods and plot holders strike, proved the make or break year for Nyanyadzi scheme.

In 1940 Nyanyadzi scheme only comprised the present block A. To allow further development, 'dense jungle' in the future block B had to be cleared off. Lateral furrows had already been dug, 'but no Native can be induced to take plots until the jungle growth has been subdued'. This proved difficult. The European irrigation supervisor, Mr Guest, found that after working for a full month with 98 labourers, only 100 acres out of 300 had been cleared. More money was required to properly stump and level the full extent of block B.^{xxxix} A full year passed, before the requested funds were allocated, and Alvord could finally request the aNC to furnish labourers for the job.^{xl} Meanwhile, the same aNC once more expressed doubts on the 'permanency' of the irrigation schemes in his district, considering their chequered history of water scarcity, flood damage and paucity of interested settlers. Before settling more Africans, he requested a survey by the Irrigation Department on the viability of the schemes.^{xli} Alvord rebuked that the Nyanyadzi river supplied ample water (only one of the two headgates was normally opened) and the aNC 'need have no fears whatever' with regard to permanency. The only things required, in Alvord's view, were a steady supply by the aNC of more funds to expand the schemes and African families to be settled.^{xlii} The Director of Irrigation concurred, stating that whilst Nyanyadzi river supply might be found wanting in the odd dry season, it should not be overlooked that Save valley irrigation schemes were primarily intended to ensure growth of summer crops.^{xliii}

In 1941, another drought intervened, drawing scores of hungry Africans to the Save irrigation schemes, in the process putting their use beyond official doubt. Alvord noted that rainfall in the Save valley had been 'without doubt, the lowest ever experienced'. Whilst all rain-fed crops had been complete failures, some 4,000 bags of food crops were produced in Nyanyadzi and Chakohwa, staving off the need for famine relief work in the area (see box 4.3).^{xliv} The officially recorded yields veiled the full extent of the success, since 'a great number of outsiders, short of food, came to work in the plots in exchange for green mealies before the crops were ripe.'^{xlv} Some of the plot holders made a fortune, selling surplus maize at 10 shillings a bag. This did not go unnoticed by the ever-ambitious Alvord. Still searching for hard needed funds to upgrade and expand the network of irrigation schemes, Alvord drew attention to the discrepancy between water rent payments and income of the average Nyanyadzi plot holder. The latter made at least 5 pounds per acre from his wheat and beans, in addition to the 9 pounds gained from maize at an average yield of 18.5 bags per acre. The total income of 14 pounds compared with a water rent of only 5 shillings. Alvord postulated that the time had come for the irrigation schemes to be 'self-supporting': the water rent should be raised from 5 to 10 shillings per acre. The money thus generated could be used to

establish a sinking fund for irrigation maintenance (allowing the purchase of a lorry to transport the maintenance gang and building material) and another fund for further development and extension of the schemes, obviating the need to draw large funds from the Native Reserve Fund which was cautiously guarded by Administrators.^{xlv}

Box 4.3: The role of the Save irrigation schemes in saving famine relief expenditure

Alvord frequently used the threat of recurrent famines in the arid Save valley to legitimise further expenditure on African irrigation. In 1933, Alvord claimed that the 754 bags of grain produced at Mutema irrigation scheme virtually obviated the need for relief grain supplied by government. After the drought of 1938, Alvord asserted that the 2987 bags of grain produced at Nyanyadzi, Mutema and Chakohwa had prevented a famine in their respective Reserves, whereas the government had failed to send 'several hundred bags of famine relief' to the one Reserve (Musikavantu) that had remained without irrigation. He begrudgingly noted this expenditure could have been saved if the Sabi river irrigation project (Chibuwe) had been constructed. In 1941 Alvord advised the government to refrain from providing famine relief grain to Musikavantu Reserve, since its inhabitants did not have the necessary cattle or cash proceeds from labour migration to pay for the grain. Rather he suggested that those who could not afford to buy grain be put to work at Sabi furrow with help of a famine relief work grant from government. Alvord argued that the provision of famine relief grain by government had failed in the past, resulting in considerable loss of revenue. In 1923 the government had provided £1217 of relief grain on credit in Chipinga, of which £269 were still uncollected and written off in 1929. Of the famine relief grain supplied in 1931, 1934 and 1938, some £1,033 was outstanding and £344 written off the books in 1940. Alvord argued he could have constructed the Sabi irrigation project for the money that was written off over the years.

Yet Alvord never compared the (increasing) costs involved in constructing, maintaining and expanding the Save irrigation schemes with the costs saved on famine relief grain. Also, Alvord failed to mention to what extent the irrigated production exceeded the subsistence needs of the irrigators (Roder 1965, 110). Alvord did benefit from the shift in the kind of famine relief provided. After 1933 the government preferred to supply famine relief by means of work-for-food on road building and construction of the irrigation projects (Iliffe 1990, 87). Thus it was hoped to address the main problem in providing famine relief grain that was experienced during the 1923/24 famine, i.e. that of transporting the supplies into remote areas. Irrigation projects were envisioned to function as local grain suppliers, saving on transport, whilst the expanding road network would allow European traders to move the grain to the place where it was needed most (Roder 1965, 110). The increased use of motorised transport by the end of the 1930s obviated the need for irrigation projects as local grain stores (Iliffe 1990, 87).

With the rent hike approved, success seemed within Alvord's grasp. But once more Nyanyadzi river interfered. Early in 1942, unprecedented floods wiped out the small MuNyanyadzi scheme, whilst damaging the intake and choking the main canal of the big Nyanyadzi scheme, requiring emergency repairs and funds from the Native Reserve Fund. Whilst the main canal was quickly fixed and the destitute plot holders from the MuNyanyadzi scheme mostly volunteered for resettlement in the newly opened up block C, another snag hit the wheel of the project's fortune. Following the example set by their colleagues in Mutambara, Nyanyadzi plot holders declined to pay the raised water rents, arguing they could not afford to pay such rates. An infuriated aNC threatened the plot holders that 'if they did not wish to pay the increased rent they would be required to vacate the land.' Responding to a call for increased food production for war thorn Britain, the aNC used the plot holders' despondency to recycle an earlier proposed plan for state tillage of Nyanyadzi project.

The plan entailed the construction of a dam on the Nyanyadzi river and departmental growing of maize and wheat on a large scale in Nyanyadzi.^{xlvii} The plan required large amounts of

African labour, which was scarce in the district. The aNC told the Nyanyadzi plot holders that if they did not pay up water rents within three weeks, he would 'find suitable employment for those loafing at Nyanyadzi' after their plots had been taken from them.^{xlviii} Alvord resented state tillage, and had discarded the aNC's earlier plan on the ground that a dam could not be built at the proposed location.^{xlix} This time Alvord had to buy into the idea. He proposed, however, to have the plot holders pay their water rent in kind, thus providing for the hard needed rations to feed departmental labourers tilling the vacant plots. In the process, Alvord hoped to get approval for the establishment of a water-driven departmental grinding mill in Nyanyadzi, an idea that was resented by the aNC who favoured the establishment of a grinding mill by a European private operator.^{li}

By the end of May 1942 it dawned on Alvord that half the Nyanyadzi plot holders would not return, leaving some 150 plots vacant. Another effect of the water rent hike was the doubling of plough charges by those plot holders who owned their own draught power, to those who did not own draught power. Alvord proposed a plan of action, involving the departmental purchase of draught oxen and ploughs, which would be used to grow early maize on all vacated plots and be hired out to needy plot holders for the old rate of 5 shillings per acre. All money generated by the sale of departmentally grown early maize and hire of oxen would accrue to the furrow maintenance fund.^{lii} A week later the situation had changed again: 75% of all plot holders had returned to the scheme. The new aNC⁵ treated the matter with leniency: old plot holders would be allowed to return until July 1942.^{liii} In the end only 30 acres remained vacant and were used for departmental maize growing. After registering Nyanyadzi irrigation project as a maize producer at the Maize Control Board (MCB), the departmentally grown maize (300 bags) qualified for the special price paid for irrigated maize delivered in the months January to March.⁶

Finally a market was found (see Alvord n.d.). Alvord requested all maize grown by Africans in departmentally controlled irrigation projects to qualify for the special maize price, or else 'they will just let this maize stand in the shocks until May or June, as in previous years.'^{liv} The threat apparently worked, and the Secretary to Treasury allowed African maize grown under irrigation to be paid bonus prices.^{lv} Next Alvord set up a departmental marketing facility at Nyanyadzi, involving two Africans to operate weighing scales, a local store room, and transport by Rhodesia Motoring Services lorry to the nearest MCB depot (in Umtali, later Birchenough Bridge). Gradually the marketing scheme was expanded to cover such crops as sunnhemp, beans and various types of fruits grown at the Save irrigation schemes. Suddenly the Nyanyadzi water-network had become an attractive financial proposition to African cultivators.

Finally success (1943-1945)

After the tumultuous events of 1942 the Nyanyadzi water-network steadily became more refined and stabilised. New crops were introduced, which made the scheme attractive to the plot holders and in 1944-45 even profitable for the department. The problem of insufficient plot holders remained, despite the forced evictions of Africans from farms in the Melsetter highlands. In 1945 the scheme was profitable and the first farmer management committee was formed, allowing further participation of the scheme's users in its management.

⁵ The transfer and replacement of the assistant NC for Melsetter may have been related to his zeal to transform Nyanyadzi project into a government estate. The irrigation supervisor, Mr Guest, was replaced at the same time. Alvord blamed him for mis-managing the plot holders revolt.

⁶ The bonus was 5/-, 4/- and 3/- in January, February and March respectively, on top of the normal price of 9/- per grade A bag.

However, the biggest success provided by the expanding network of irrigation schemes in the Save valley, was its capacity to obviate the need for government provision of famine relief.

Crops

Following the regulations contained in the 1939 irrigation policy, Alvord instructed the Irrigation Supervisor to produce a list of all plots to facilitate control over the planting of crops according to a compulsory crop rotation. In 1940, the crop rotation included maize during the wet season and wheat (50%) and a legume crop (50%) during the dry winter season.^{lvi} Initially Alvord opted for beans as the preferred leguminous crop. Alvord declined inclusion of cotton in the crop rotation on account of the abundance of *baobab* trees in the Save valley.^{lvii} The *baobab* tree acted as host to the harmful stainer beetle.⁷ The wheat crop, though initially grown as a cash crop, gradually became a subsistence crop, with bread included in the local diet as the preferred 'staff of life'.⁸ In 1942 sunnhemp was included as leguminous crop in the rotation. This crop soon became the 'real money maker' of the scheme, with the seed sold at a steady price of £3 per bag⁹ throughout the 1940s. The seed was sold through the departmental marketing scheme to high veld farmers, who used to plant the crop as green manure in their crop rotation. In the early 1940s the government even subsidised its price with 10 shillings per bag, in order to deal with the destructive monocropping practices prevalent amongst European farmers.^{lviii} The advantage of sunnhemp was that it could be ploughed under 'for the land to stay fresh', as a local plot holder related to me, whilst at the same time its seed could be used as cash provider. Another advantage was that sunnhemp could be beneficially ploughed under before harvest during drought years.^{lix}

Thus the cropping pattern stabilised in three successive stages. From 1934-39, the dominant pattern consisted of maize in summer¹⁰ and wheat in winter. During 1940-42, maize in summer and beans (50%) and wheat (50%) in winter prevailed. And from 1943 to 1956 the dominant crop pattern consisted of maize in summer, and wheat (50%), sunnhemp (45%) and beans (5%) in winter. After 1952 the share of sunnhemp in the winter rotation tapered off to zero in 1958, since insect damage terminated high veld use of sunnhemp as green manure crop (Roder 1965, 128-30).

The really attractive crop was introduced in 1942 and consisted of fruit trees (initially mainly bananas and paw-paws, later mango's) and vegetables, which were grown along the edges of plots, along furrow banks and on residential stands. The department itself also embarked on an elaborate orchard of fruit trees on vacant land at the Northern and North Western end of block A. The latter became the Nyanyadzi experiment station in 1946, and was worked by demonstrator trainees to produce fruits and beans for departmental sale. In the mid-1940s, four plot holders that belonged to Alvord's Mount Selinda network got permission to devote one or two acres to full-time production of fruits and vegetables. These men subsequently became the most wealthy plot holders in the scheme, with two of them buying cars to transport their produce to the Umtali green market.^{lx} Fruits and vegetables not only provided a substantial income, but also made for healthy diets. Roadside fruit stalls were erected in both

⁷ Cotton cultivation in Nyanyadzi was introduced in 1958, by which time the Save Valley Experiment Station (opened in 1951) had experimented with cotton and a mixture of insecticides to control celworm and stainer beetle infestations.

⁸ Whereas in 1945, 45% of the wheat harvested was sold, by 1949 the amount sold had dropped to 5% of total yield.

⁹ Average yields attained in Nyanyadzi stabilised at 4 bags/acre, providing a handsome return of 12 pounds/acre.

¹⁰ Most plot holders also grew *rapoko* during summer on rain-fed land outside the scheme's perimeters.

Nyanyadzi and Chakohwa to sell fruits to passing motorists, but the bulk of the sales was done through the marketing scheme that shipped loads to all major cities in Rhodesia.

Plot holders

Throughout the 1940s the development of the scheme's infrastructure (furrow network) outpaced the rate of settlement. The implementation of the amended Land Apportionment Act (1941), and subsequent termination of the Private Labour Ordinance on Melsetter farms (see 1.5), did not result in a mass resettlement of evicted Africans from Melsetter, Chipinga and Umtali farms. Rather, a gradual influx of settlers took place at an undulating pace, instigated by drought induced hunger and at individual Africans' initiative.

A 1940 request by the CNC to Alvord to resettle Africans expelled from European farms in Charter district, on Melsetter irrigation schemes, was rejected by Alvord, since he thought it more beneficial to settle these Africans on the new Devuli scheme in their home district.^{lxii} A second request, in 1943, to resettle expelled Africans from Melsetter belonging to Chief Muwushu, was welcomed by Alvord, since Nyanyadzi was also under Chief Muwushu's control.^{lxiii} A third request involving Chief Chikukwa and his people from the eastern highlands in Melsetter, was again declined by Alvord, since moving them from a cool, humid area to a hot, arid area would 'mean a drastic change of life'.^{lxiii} In the end none of the planned mass resettlements of expelled Africans materialised¹¹, leaving Alvord desperate for settlers.

In 1945, Alvord noted only half the scheme was occupied, which did not warrant running the main canal at full capacity. The latter was required to work the newly constructed (water-driven) power plant and affiliated cart factory. Thus, Alvord recommended a publicity campaign to invite new settlers from overcrowded Reserves all over Rhodesia.^{lxiv} In a newspaper article in the Rhodesia Herald, Alvord is quoted accusing the previous NC Melsetter of refusing to settle Africans of senior age or from outside the district.^{lxv} The NC Melsetter duly refuted Alvord's allegations, stating that the problem was caused by Africans refusing to move to irrigation projects, since

'they know that at these projects it is necessary for them to work their holdings all the year round. With many of their relatives in the Union (South Africa, AB) and larger centres of this colony and who provide them with their cash requirements, it is not necessary for them to change their old methods of agriculture.'

The NC further claimed that if all Reserves had been centralised and individual arable acreages been reduced, Africans might have been more willing to practise proper agriculture in an irrigated setting. He stuck to his refusal to allow senior Africans to take up plots, since such would only increase the number of absentee landlords.^{lxvi}

Yet, the scheme gradually filled during the latter half of the 1940s, mostly through voluntary settlement of individual Africans with or without their families. Three different categories of new settlers can be distinguished. One category consisted of mostly mission educated Africans who were attracted to Nyanyadzi for professional reasons and thought of retiring from their profession in order to take up irrigation as an interesting business proposition. An example of such a settler is Luc Jambaya, who as a young boy helped Alvord at Mount Selinda mission to dig an irrigation furrow during the drought of 1922, was subsequently trained as teacher, and after some years working the mines in South Africa returned to Alvord to start work within the Department of Native Agriculture. In 1944, Luc assisted Alvord

¹¹ Other irrigation schemes, notably Chibuwe, Devuli and Maranke, did benefit from movement of Africans off European farms under the Land Apportionment Act.

pegging the upper level canal in Nyanyadzi. Luc was impressed by the hive of activities. In 1946 Luc was transferred to Nyanyadzi to work as an office clerk, and he applied for a plot in block A. During his first season, the drought of 1947, Jambaya managed to sell five bags of maize in exchange for five heads of cattle (the famine price of a bag of grain, *vide* Iliffe 1990). In 1949 Luc resigned, realising he could make a fortune in irrigation, whereas as a clerk he only earned £4 plus rations a month.^{lxvii} Another such settler was Rishon Gwinya, who was born in Ngorima, Melsetter district, and went to school at Rusitu mission station. After leaving school he took up teaching, first in Mhakwe and later at Changazi, south of Nyanyadzi. In 1946 he settled in Nyanyadzi with his family. He took up 4 acres in block B (later he moved to block A). After one more year of teaching at the nearby Gudyanga school, Gwinya resigned and went for full-time irrigation farming, since it was more rewarding than his monthly pay slip of £2.^{lxviii}

A second category consisted of individual Africans from Melsetter, Umtali and Chipinga districts that found life on European farms increasingly hard and rents demanded by greedy European farmers too high (see Ranger 1985). Yet the biggest influxes of new settlers were triggered by the droughts of 1941, 1944 and 1947 (see graph 5.1). These settlers comprised hungry and destitute people from arid Reserves across the Save river, and to a lesser extent from Melsetter district itself. For instance, during the unprecedented famine of 1947, some 41 new families settled in Nyanyadzi, an increase of 20% on the previous total of 210 families.

1945: First profit and first plot holder management committee

At the end of the 1944-45 season the Nyanyadzi water-network produced its first profit (see table 4.1). The profit comprised almost 60% of the total turnover, sparked by the sale of departmentally grown fruits and other crops. Possibly inspired by this sudden success, first steps were undertaken to give the plot holders a greater say in the scheme's management. In September 1945, a plot holder representative committee was elected into office, consisting of two plot holders from each block, complemented by the agricultural and community demonstrator as government representatives. The main issues discussed during its first meeting were the system of furrow maintenance, vegetable gardens, and the newly launched rural industrialisation policy. A majority of plot holders objected to the prevalent maintenance system of having every plot holder work one week out of four throughout the year. It was decided to revert to the system of two years earlier, i.e. paying a small maintenance gang of labourers from the Furrow Maintenance Fund. With regard to the cleaning of the main canal, it was decided that all plot holders would turn out twice yearly (in September and April) to do the work without pay. The newly inaugurated Furrow Committee was to organise the work. Furthermore, the assembly of plot holders reacted enthusiastically to the news that a newly appointed community demonstrator would 'organise classes in building to erect improved houses for them and advise and assist them in village layout and sanitation.'^{lxix} A final issue for debate involved the claim of plot holders that they had been promised irrigated gardens along the perimeters of the scheme, free of charge. Alvord contended this was a mis-conception: such free gardens had never been allowed outside plots and residential stands.^{lxx} A compromise was struck: gardens along canals and plots would be allowed against payment of a small fee.

Not much is known on the further life of this plot holder committee. Besides this one meeting, no further record of it was found in official proceedings. The present kraalhead for the block C area, however, remembered vividly how his father Pirani Nyanhanda, the then kraalhead, had a lively discussion with Alvord on the issue of handing over the scheme to the plot holders:

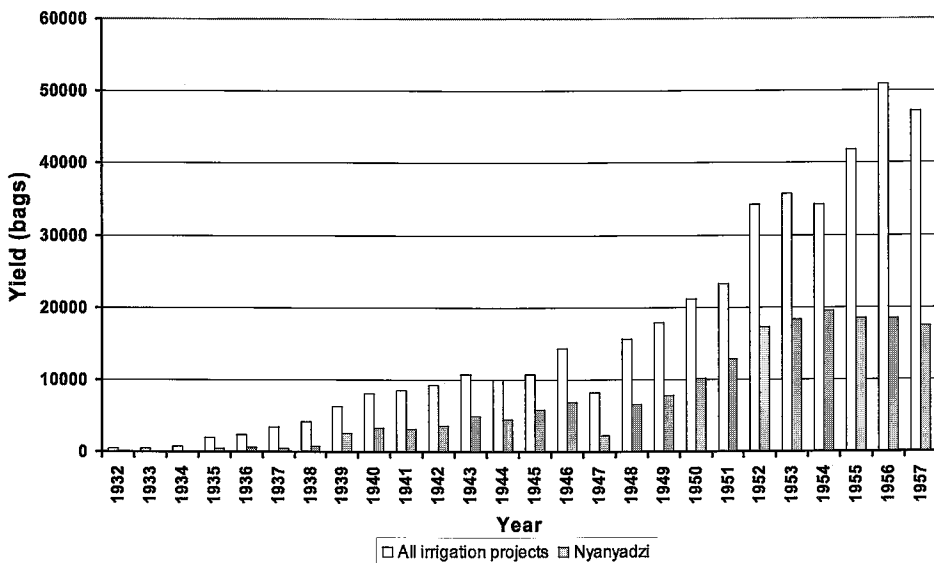
'Pirani said: "We like a whiteman, because if a black man looks after us, they are not good. Jealousy emerges." Alvord replied: "Ndakapedza nguva rangu fundisa vanhu vatema (If I had known that black people could not lead themselves, I would not have taught you)"¹

Table 4.1: Revenue and expenditure Nyanyadzi project, 1 April 1944 – 31 March 1945

Revenue			Expenditure		
Item	£.s.d	(%)	Item	£.s.d	(%)
Wages	90.02.02	16.0			
Water rents collected	233.05.00	41.5	Rations	106.01.08	18.9
Handling fees	53.19.08	9.6	Material lime kiln construction	13.16.10	2.5
Credit for empty cement bags	5.15.06	1.0	Upkeep implements	2.16.00	0.5
Fruit sales	109.14.08	19.5	Cement for construction and		
Crop sales	68.11.04	12.2	repairs to buildings	14.09.04	2.6
Sale of scotchcart	12.00.00	2.1	Seed	.07.06	0.1
Cement supplied to Melsetter					
dip tanks	.12.03	0.1	Grain bags	78.05.02	13.9
Grain bags sold	75.17.11	13.5	Implements	5.13.00	1.0
Hire of Oxen	2.05.00	0.4	Cooking utensils	12.03.07	2.2
			Sail Twine	.08.00	0.1
Beans grown by plot holders	11.00.00	2.0			
			Balance	353.13.03	62.9
			Carried forward (Profit)	208.12.06	37.1
Totals	562.01.04	100		562.01.04	100

Source: NAZ, S160/IP1-4, Report, irrigation projects, Melsetter district, 1944-45

Graph 4.1: Nyanyadzi's contribution to the total grain production from African irrigation schemes, 1932-1957



Protection against famine

Another measure of the success of African irrigation schemes was the protection they offered against famines. The irrigation schemes provided local grain stores, obviating the need for government expenditure on the provision famine relief grain in the event of major droughts. During the 1922 famine relief operation, the largest ever undertaken by the Rhodesian government, a total of 5,222 bags of grain had been ferried into Melssetter district to stave off widespread starvation (Iliffe 1990, 75). By 1939 the combined grain output from all Save valley irrigation schemes already exceeded this amount, and by 1943 irrigated production output was double the 1922 famine relief requirements (see graph 4.1). Nyanyadzi was the most successful of all Save irrigation schemes, responsible for over 50% of all grains produced in them between 1945 and 1954.

4.3 CRAFTING A MODERN IRRIGATION NETWORK AND COMMUNITY (1945-1950)

Fine-tuning the network (1945-1949)

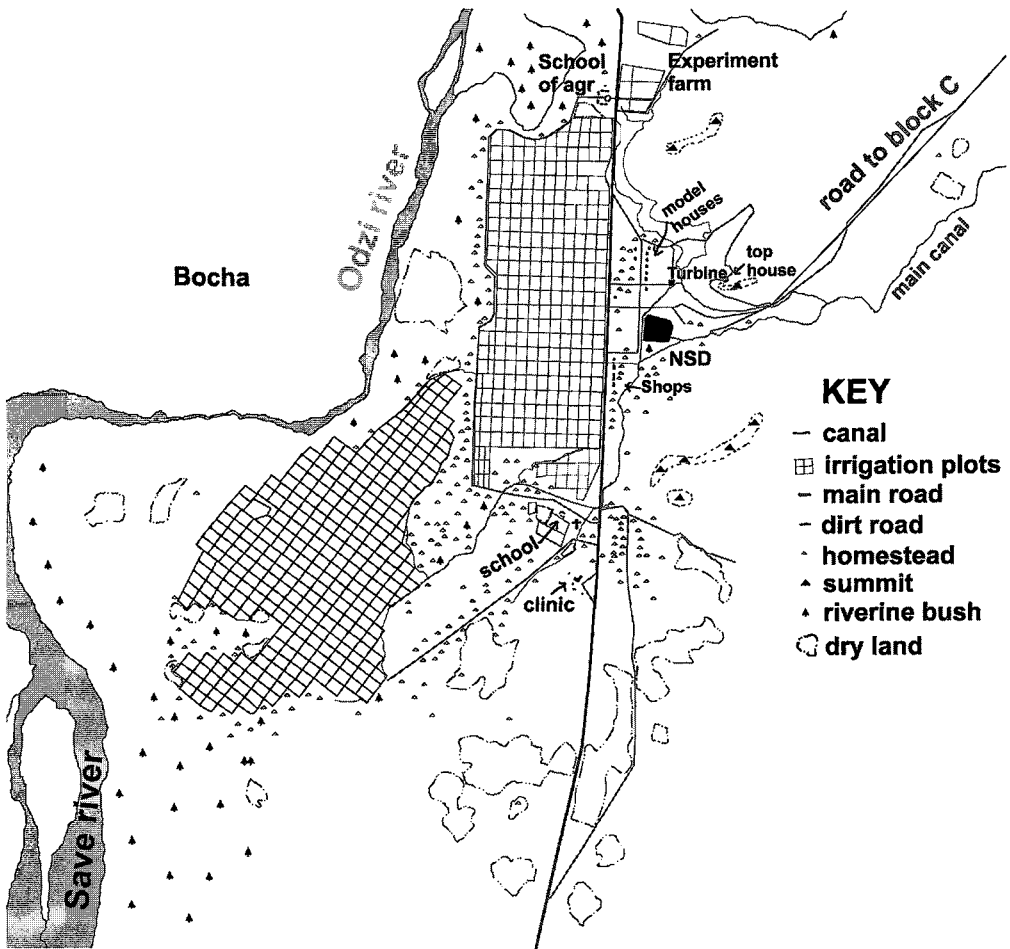
Instead of a turnover of the scheme to its users, the end of the 1940s witnessed further refinement and expansion of government control over the burgeoning water-network. The network of furrows was refined by means of new furrows, lined sections and the installation of water gates. In spite of these efforts water remained a rather elusive actor to control, leading to recurrent calls for the construction of a dam on the Nyanyadzi river. The very idea of a dam inspired various government actors to propose grand plans for expansion of the network across the whole of the Save valley. The increase in the number of plot holders and elevation of Alvord's men to a fully fledged Department of Native Agriculture, led to a stormy increase in the number of government employed staff at Nyanyadzi, as well as a flurry of measures aimed at controlling and synchronising the agricultural operations of a multitude of plot holders. These developments negatively affected the cost recovery rate of the scheme, and triggered yet another debate amongst Administrators and Agriculturists over the need to increase water rents and impose crop levies.

Expanding control over water and space

With the scheme filling to full capacity, it became imperative to refine control over water flows throughout the network of furrows. In 1945 water gates were installed on both the big distribution furrows and the lateral furrows within the blocks.^{lxxii} New distribution canals were dug to service the expanding blocks B and C. Another diversion from the main canal (the upper level canal) was cut on the edge of both *koppies*, to service the new experimental farm and departmental plots at the north-eastern end of block A, and provide the necessary head for the water driven power plant (see map 4.2). This work required some engineering ingenuity, involving a concrete wall, and brick lined furrow along a steep mountainside. The new furrow collapsed several times, a propensity it shared with the other furrows in the scheme that required continuous repair, particularly in sandy stretches and along plots where frequent cuts were made in the furrow banks to apply irrigation.

Other ordering attempts focused on bounding the water-network as a separate entity in space. Villages with residential stands along straight roads were laid out along the western and southern edges of blocks A, B and C.^{lxxiii} At the request of the NC Melssetter all irrigation schemes in the district were centralised, to facilitate administrative control, and prevent marauding cattle to invade the schemes, and land hungry plot holders and their families to invade grazing areas.^{lxxiv} In Nyanyadzi, this entailed fencing off irrigated areas, and designating the land East of the main Umtali-Fort Victoria road as grazing land, where cultivation and residence was prohibited.^{lxxv}

Map 4.2: Nyanyadzi irrigation scheme in 1950 (showing blocks A & B)



Increasingly, the network builders turned their attention to an element that was found lacking in the water-network, yet vital for further stabilisation and expansion: a dam. The droughts of 1944 and 1947 made perfectly clear that if Nyanyadzi scheme was to live up to its expectations, a dam on the Nyanyadzi river was required.^{lxvii} The first proposal for a dam was done by the NC Melsetter in 1942. When the Prime Minister in June 1946 announced plans for large scale irrigation development in the Save valley, Alvord promptly proposed construction of a joint African-European scheme comprising some 42,000 ha. The plan consisted of a main intake just downstream of the Odzi and Save river confluence, a main canal on the left bank of some 60 kilometres, and a string of storage dams on all eastern tributaries to the Odzi and Save rivers (including the Nyanyadzi river). The scheme would subsume all existing Save valley irrigation ventures.^{lxviii} In 1949, an international consultancy firm was asked by the Irrigation Department to do a feasibility study (the Gibb plan) for an

all European version of the Save scheme.¹² The plan received favourable consideration by the Standing committee on large-scale irrigation projects (GOSR 1952), but was never fully implemented.

Expanding managerial control

Water distribution among the hundreds of plots soon became a complicated affair. In 1945 the first two gatekeepers, called water bailiffs, were recruited from the ranks of the plot holders. A system of water rotations was introduced. The task of the bailiffs was to divert the water by means of opening and closing gates on the main arteries of the network, and to note water turns of individual plot holders on a list. Both water bailiffs reported to the agricultural demonstrators, who increasingly devoted their attention to paper work and tending of demonstration plots.^{lxxviii} To effectively control the work of the bailiffs the plots had to be numbered, for which a map was urgently requested by the NC.^{lxxix} The resident LDO had a car at his disposal to check on progress of field work in the three government irrigation schemes in the district, and visit the provincial office in Umtali for feed-back and support.

Staff numbers rose during the late 1940s, partly in response to the increased scale of activities in Nyanyadzi. In August 1946, the monthly maintenance bill listed one foreman, two water bailiffs, two crate makers (for fruits), one cook, two (ox) drivers, two plough boys, two plough leaders, three gardeners, two checkers (for weighing marketed produce), and six men building outlets and gates. Including one cattle herd, and 21 rations for labourers of the maintenance gang, the total bill amounted to £35 per month, which had to be drawn from the furrow maintenance fund. In addition the staff complement on fixed establishment in 1947 at Nyanyadzi comprised one European Land Development Officer, one irrigation supervisor, two agricultural demonstrators, one building supervisor, one community demonstrator, and three senior instructors at the school of agriculture. The heavy presence of the state (nine staffers) at Nyanyadzi¹³ reflected the importance of irrigation, and Nyanyadzi scheme in particular, as object of state intervention.

The considerable staff establishment at Nyanyadzi, operating in a hot and malaria stricken area, was bound to produce occasional frictions between the European LDO and his African subordinates, as well as between African staff members themselves. In particular, a newly appointed LDO, Mr Saunders disliked the preferential treatment the Mount Selinda trustees amongst his staff got from the director, Alvord. After allegedly denouncing some of them in public, and removing some of their duties, the house of the agricultural demonstrator was burned to the ground during the night. Another such mysterious incident befell the house of irrigation supervisor Sigauke in 1945. The Alvord trustees wrote to their *Inkosi* (master/father) accusing LDO Saunders of 'careless talks' and 'maltreatment'.^{lxxx} Alvord proposed an immediate transfer of the LDO,^{lxxxi} which was duly effected.¹⁴

¹² The Gibb plan comprised two large-scale dams and two main canals (one on each bank of the Save river) capable of irrigating 134,500 hectares of land. European holdings would comprise 56 hectare plots for the production of lucerne, wheat, groundnuts and maize combined with beef production.

¹³ The staff allocation for the whole of Melssetter district comprised 17, of which eight were deployed outside Nyanyadzi. Yet, two agricultural demonstrators and two community demonstrators worked in Chakohwa and Mutambara irrigation scheme, leaving only one LDO, one forestry demonstrator, one community demonstrator and one agricultural demonstrator to work in the non-irrigated areas of the district.

¹⁴ The exact reasons for Saunders' alleged behaviour could not be unearthed. In any case, Saunders could have taken exception to the patronising behaviour of demonstrator Dube and supervisor Sigauke, men with long careers (10 years) in Nyanyadzi. Sigauke in particular used demonstrator trainees to work his personal irrigation plots, and amassed a herd of 69 cattle during his stay at Nyanyadzi. Alvord was likely to turn a

In spite of the formidable force of skilled workers operating in the district's irrigation schemes, the NC Melsetter complained at the height of the drought of 1947 that he lacked sufficient labour to provide all irrigation projects with maintenance gangs, stating:

'It is now a practice to recruit a gang of natives from Nyanyadzi project every three months. Natives anticipate this round up and go away from their kraals until they know the round up is over.'^{lxxxii}

In Nyanyadzi itself, this scarcity of labour was somewhat relieved by the ex-servicemen and third year demonstrator trainees at the newly established school of agriculture. These were required to work the departmental irrigation plots, and assist in constructing staff quarters and furrow extensions, as part of their curriculum.

But it was not only the maintenance of the network and water distribution that required refinement. In order to get the multitude of plot holders make the most of their irrigation operations, calls were made for further regulation of their behaviour. In typical missionary fashion, Alvord redrafted the five conditions of occupation of the 1939 policy, and transformed them into ten in the new 1947 policy. New additions concerned the obligation to provide free labour for the bi-annual canal cleaning exercise, a limitation on the number of cattle grazed in vicinity of the project (maximum of six heads), and a prohibition on crop residue burning. Allowable cropping and irrigation practices were further defined, by stipulating sowing and reaping dates, and disallowing irrigation out of turn.^{lxxxiii} Plot holders in Nyanyadzi disliked these strict regulations, testified by 'many anonymous letters from the vicinity of Nyanyadzi where Natives appear to resent control of their irrigation operations.' The Secretary for Native Affairs, who brought these letters to Alvord's notice, thought publication of the 1947 irrigation policy an apt response to this resentment.^{lxxxiv}

Administrators milking the irrigation cow: a refined cost recovery policy

The top-heavy presence of the state in Nyanyadzi soon plunged the scheme's accounts into red figures. In February 1946 the Provincial Native Commissioner was the first to note the shortage of maintenance funds, in contrast to the irrigators who did 'very well financially'. He proposed to charge crop levies in excess of prevalent handling fees that only pampered the plot holders. In the PNC's view the plot holders received the full purchase price, whilst the departmental staff did the organising.^{lxxxv} Alvord agreed to a rise of the handling fee from 3d. to 6d. per bag, but since it were the plot holders themselves who organised the marketing scheme, 'the increased levy would have to be decided on and agreed by them.' Possibly fearing another plot holders strike (*cf* 1942), Alvord categorically opposed any further rise in water rents.^{lxxxvi} This remark set the scene for intense debate among Administrators at different levels in the organisation on the issue of financial self-sufficiency of irrigation schemes and means to milk the prosperous irrigation cow to generate funds for African development outside irrigated areas.

The NC Melsetter for instance observed that irrigation was no longer solely used for famine protection. Rather commercial crops were grown in the schemes that provided the plot holders with hefty incomes, without the obligation of commensurate contributions to the cost of agricultural supervision and maintenance. The NC proposed a 5% levy on all crop sales, to be used for further development of the schemes and needy areas outside the schemes. The NC expected the plot holders to agree to the imposition of such a levy since they were deemed

blind eye to such personal favours, appreciating the loyalty of these men of the first hour. Saunders was, apparently, less inclined to do the same.

‘progressive’.^{lxxxvii} The PNC concurred and wondered why Alvord opposed it. In his view ‘the time has come when they (the schemes, AB) should stand on their own feet.’^{*lxxxviii}

The debate was given some urgency with the news that Nyanyadzi scheme had made a loss over the 1945–46 financial year and that the LDO had run out of cash due to disappointing fruit yields. The NC Melsetter this time urged for the imposition of either crop levies or a raise in water rents.^{lxxxix} After news that the plot holders would accept a crop levy of 5%, it was decided to keep maintenance funds separate from marketing funds so as to enable the formation of a single purpose marketing co-operative in the near future.¹⁵ To cover the maintenance costs the water rent would have to be increased.^{xc} Once more Alvord protested vehemently. He considered a water rent of 10 shillings per acre ample enough: if it proved insufficient it was up to the resident LDO to ‘cut the cloth to suit the material’.^{xcii} However, in November 1946 Alvord was forced to give in. The CNC announced a rise in water rents from 10 to 15 shillings per acre, as from 1947 onwards.^{xciii} The imposition of crop levies was kept pending till a policy on co-operative marketing for Africans had been formulated.¹⁶ In 1951 a further rise in water rents was imposed (to 25/- per acre) by the CNC, who argued that the previous rate amounted to a ‘ridiculously low figure’ compared with the plot holders’ return.^{xciii}

Crafting a modern African community (1945–50)

As elaborated in chapter two, Alvord’s development vision entailed more than the transformation of agricultural practices. Alvord cherished the ideal of a modern self-sufficient agrarian community, characterised by a village with straight roads, square houses, and centrally located church, school, clinic and business centre. The excess labour that could not be employed in agriculture would be absorbed in rural industries providing the community with the crafts and commodities it required. Once the viability of Nyanyadzi as an irrigation venture had been established, Alvord increasingly focused on crafting the modern African community he had in mind. Basically this entailed setting up a modern village from scratch, establishing African businesses and basic community organisations, and developing rural agro-industries that could provide employment, based on locally produced raw materials.

A modern village

The plot holders were settled in straight lines along the edges of the irrigated blocks. During an annual conference of community demonstrators in Nyanyadzi in 1941, three model African houses were constructed, squarely shaped, made out of bricks and concrete floors, and consisting of three to four rooms (see Photo 6).^{xciv} Again later, at the annual conference in 1945, four additional model houses were constructed. These new square houses represented nothing short of a ‘social revolution’ aimed at the elimination of the African ‘pole and dagga’ rondavel hut, that European officials regarded a ‘breeding ground for sickness and death’ and a consumer of local timber.^{xcv} The model houses initially also reflected the emerging stratification of modern African society: government staff and demonstrator trainees exclusively inhabited them. The residence of the European LDO and the guest house for official visitors (top house, located on top of a *kopje*), were physically separated, both in distance and elevation, from the African staff quarters and those of ordinary residents. Only after 1945 did the local community demonstrator and his class of trainees at the Nyanyadzi school of agriculture, direct his attention to the design and construction of improved houses for resident plot holders.

¹⁵ The argument in favour of such separation given by the senior agriculturist was that a levy on production for use in maintenance would be ‘tantamount to a tax on the more energetic and progressive.’

¹⁶ In actual fact, it would take another 13 years before the Nyanyadzi producers’ co-operative was started.

As early as 1941, Alvord pressed for translocation of the Nenohwe school, North of the Nyanyadzi river, to the more populous Nyanyadzi village, and proposed roundly shaped classrooms be built. The inspector of schools disliked Alvord's interference, and proposed conventional square classrooms as well as strict separation of the church from the school.^{xvii} However, in 1943, Nyanyadzi school was established under the auspices of the United Methodist mission station at Mutambara, and located next to the Nyanyadzi Methodist church. Christian worshipping had been started by irrigation supervisor Zito Sigauke in 1933, who ran regular church services in a provisional shed under a big *muchu* tree.^{xviii} The link between mission Christianity and education was despised by Administrators, who favoured the establishment of non-denominational schools at progressive, mixed communities, such as Nyanyadzi.^{xix} By 1950, some 400 children attended Nyanyadzi school, whilst another 400 children and adults went to evening school at the Nyanyadzi school of agriculture (Alvord 1958, 57).

In 1945 a medical clinic was opened, south of Nyanyadzi business centre, which was located along the main Umtali – Fort Victoria road. The School of Agriculture, and newly established experiment station, provided a continuous influx of outsiders to Nyanyadzi, consisting of a mixture of ex-servicemen,¹⁷ aspiring (purchase) farm pupils and demonstrator trainees. These pupils not only brought an exciting mixture of social life and entrepreneurial activities¹⁸ to Nyanyadzi, but also came in handy to realise the rural industrialisation plans of Alvord, which depended on the mobilisation of skilled labour.

The rural industrialisation policy

The rural industrialisation plan for Nyanyadzi started modestly in 1942 with the installation of a water wheel and grinding mill on the main canal.^{xx} The mill was used to grind departmental rations. After locating limestone formations near the nascent administrative centre of Nyanyadzi, a wood-fired limekiln was constructed. To run the kiln, first pieces of limestone would be hacked out, which were then piled in the kiln and burnt for seven days with help of local timber. Next water would be poured over the heated limestone, cracks would appear and lime could be extracted^c to make bricks and roof tiles, saving on cement expenditure. Later, the lime was used on all irrigation projects to improve soil fertility.

As usual, Alvord had bigger plans in store. The basic idea, as proposed in 1943, entailed the integrated development of a water power plant and cart factory. The plant consisted of a 56 horse power turbine to generate power for all sorts of industrial enterprises, such as a saw mill, a grinding mill, oil pressing equipment, alcohol production, fibre extraction from sunnhemp, and the cart factory. The latter aimed at the production of scotch carts for African use all over the country, thus facilitating a ban on the use of destructive sledges, that were widely used and a major cause of erosion. In order to entice Africans to buy scotch carts, these had to be produced at an affordable price. Furthermore, to supply the whole country, Alvord envisaged the training of African cart makers at the Nyanyadzi factory. These apprentices would, after training, return to their respective Reserves and start cart factories themselves on a small scale.^{ci} The plan looked simple enough, but required the mobilisation

¹⁷ After the conclusion of hostilities in 1945, the Rhodesian government had promised free training in agriculture for returning European servicemen. This favour was later extended to African ex-servicemen, precipitating the establishment of the school of agriculture at Nyanyadzi (Alvord 1958, 39). However, most of the pupils at the school were aspiring Native Purchase Farm applicants, providing the bulk of the annual intake of 50 to 75 pupils at Nyanyadzi.

¹⁸ Four ex-servicemen took up plots in block D after conclusion of their training, whilst others tried to start businesses in Nyanyadzi (see below). Interview with Luc Jambaya, Nyanyadzi, 24 June 1997.

of various resources necessitating linkages stretching as far as England and the USA. A new (upper level) canal had to be constructed to generate sufficient head for the power plant, and various parts (wheels, axles and bodies for the carts, saw mill, turbine) had to be imported from overseas. The process of building the industrial network was fraught with setbacks, each setback triggering new interlocking plans from Alvord. However, five years after the official launch of the Native Industrial Development policy (1945), the Nyanyadzi factory was closed down, and the remaining equipment up for sale.

After the launch of the policy, Alvord proposed in 1946 to the Rhodesian Industrial Development Committee to produce sunnhemp fibre at Nyanyadzi with the help of 4 retting tanks and a decorticating machine. Thus Alvord made the most of sunnhemp production: selling the seed to European farmers, using the straw for the manufacture of fibre for ropes, and ploughing under crop residues to maintain soil fertility.^{ci} Early in 1947, the first sunnhemp fibre was extracted and compressed into bales at the Wattle Company for export. In June of the same year a South African company expressed interest in the fibre for sale on the English market, which suffered from falling supplies from India. The company required a sample of 100 long tonnes of fibre that was mechanically crushed and compressed, in order to judge whether the plans for an annual output of 5,000 long tonnes of fibre were feasible.^{cii} A tractor driven decorticator was hastily put up at Nyanyadzi and some 9.5 long tonnes of fibre were extracted at the end of 1947. However, the plot holders who had to physically do the dirty work of retting the fibre in the tanks, despised the work.^{civ} In 1948 fibre production ceased, on account of the exorbitant cost of marketing and shipping the fibre to England.^{cv}

The cart factory took even longer time to germinate, in part due to the long shipping times of foreign materials required. It took till the end of 1947, before the saw mill, turbine and steel axles, wheels and cart bodies had arrived on site. However, the sawmill had been wrongly installed and required re-assembling.^{cvi} When that was done, it became clear that the 'well wooded Save valley' that Alvord had observed in 1945^{cvi} was no more. Local timber proved more scarce than expected, and of dubious quality. The wood provided by the *mukamba* (*afzelia quanzensis*) tree had to be seasoned for at least a year, requiring a seasoning shed. The first 20 scotch carts that had been manufactured using local timber cracked up and had to be re-assembled. Attempts to grow gum trees in the departmental fields failed on account of a lack of water in 1947. Furthermore a planer and thicknesser machine had to be imported from England to produce planks of sufficient length and strength. By December 1948 only four carts had been produced, whilst Alvord requested another financial injection.^{cvi}

In March 1949 the assistant secretary for Native Economic Development recommended closure of the factory within a year's time, on account of a scarcity of indigenous wood in the vicinity of Nyanyadzi. To warrant retention of the water driven turbine the assistant secretary proposed the introduction of an industrial training course at the school of agriculture or alternatively the development of central dairy plant, as proposed by Alvord. In total three carpenters, seven apprentices and eight labourers were employed at the factory.^{cix} Upon closure of the factory in 1950, a total of 250 scotch carts had been manufactured and sold at £25 to Africans across Rhodesia, through local offices of NCs.^{cx} Meanwhile the Farmers Coop in Salisbury had taken up production of cheap scotch carts, allowing Alvord to claim success in inducing local industry to fill this gap.^{cx}

In a last ditch attempt to save the water driven turbine from dismantlement, Alvord proposed another win-win option: the installation of an electric pumping plant on the Odzi river driven by the existing turbine. Thus Nyanyadzi could augment its water supply, which had fallen

short in three consecutive years (1947-49), whilst beneficial use could be made of the turbine. Furthermore the pumps would allow the existing scheme to be expanded to cover another 600 acres (242 ha) in blocks D, E, F and G.^{cxii} Alvord, however, had overlooked one disturbing feature of this scheme: full flow was required to operate the turbine at the required 50 horsepower to run the pumps. As an engineer from the Irrigation Department pointed out, the very need for the Odzi pumps was critical at times when the Nyanyadzi river, and by extension the main canal, ran low. So, instead of pumps, the engineer proposed the construction of a night storage dam at Nyanyadzi to even out drought induced water scarcities.^{cxiii}

Administrators thwarting African businesses

With state initiated rural industries faltering, the development of business activity depended on either private European or African entrepreneurial initiatives. Nyanyadzi, with its hub of agro-economic activities and prime location on the Umtali-Fort Victoria road, was well suited for the development of African enterprise. The irrigation scheme with its school of agriculture and its expanding community of relatively wealthy agricultural producers provided a source of attraction for Africans of various alloy, drawing in traders, builders, teachers, ex-servicemen, as well as young demonstrator trainees. From 1945 onwards the NC Melsetter received regular requests from both plot holders and outsiders to start a business in Nyanyadzi. Besides some roadside fruit stalls and improvised tearooms under trees, Nyanyadzi harboured only one properly established General Dealers' store to provide commodities that were not locally produced.

A certain Sergeant Myambo and his brother saw room for another general dealers' store and applied to the NC, only to find their application turned down on account of there being already one store in Nyanyadzi. In 1947 Sergeant Myambo teamed up with some retired government employees and applied for a store site again, this time under the name of Gazaland co-operative society. Alvord was eager for a co-operative society to take over the departmental marketing arrangement in Nyanyadzi. The CNC nevertheless put the application on hold, until such time as suitable co-operative legislation for Africans had been drafted.^{cxiv} Two months later another two African applications for a general store at Nyanyadzi had come in. The acting NC Melsetter found he could not favour any one of the three, since he thought neither of them had adequate capital, credit facilities nor knowledge of business methods. Instead, he favoured a European business concern,¹⁹ which however was not forthcoming.^{cxv}

By 1949, Nyanyadzi business centre comprised a tiny affair consisting of two officially recognised African businesses: a butchery and general dealers' store.²⁰ In 1951, a conflict between 15 Mutambara businessmen *cum* plot holders and the local LDO, who threatened to evict them, triggered yet another debate on the desirability of African business development

¹⁹ The plight of African businesses did not always meet such opposition. In August 1948 the NC Melsetter favoured a local African over a European to run a general dealers store at Changazi, some 15 kilometres south of Nyanyadzi. NAZ, S2400/3779, Letter from NC Melsetter to PNC Umtali, 28 August 1948.

²⁰ The butchery was operated by Robert Mukome, a native of Mutasa district, who arrived in Nyanyadzi in 1948 and started operating initially as a building contractor, owning a lorry. After acquainting himself with a nurse from Nyanyadzi clinic (his later wife), he started the butchery in 1949. Even after attaining a licence, business was not easy. For a butchery £10 per annum had to be paid for the licence, with an additional £6 rent charged on businesses operating in Reserves. The licence and rent charge far exceeded the turnover that Mukome could make on a slaughter quota of 5 heads per month. The general dealer store was owned by a certain Goney, a businessman from Mutambara. In addition, several other plot holders ran un-official businesses like tearooms, eat houses and fruit stalls.

in irrigation schemes.^{cxvi} It transpired that the NC was in favour of successful plot holders starting private business enterprises, but not the other way round, since there was a scarcity of plots and the NC feared absentee landlordism amongst businessmen.^{cxvii} Most businesses in irrigation schemes that were operated by plot holders 'still needed their irrigated plots for making a living.' By 1957 the number of African businesses in Nyanyadzi had risen to six, of which local plot holders ran two.²¹

4.4 CONCLUSION: FROM FAMINE PROTECTION TO INTENSIFIED SETTLEMENT AND PRODUCTION

The story of the making of Nyanyadzi project is one of water. Water has remained the most powerful (f)actor shaping the possibilities and impossibilities for realising the dream. Water acts through its abundance as well as its conspicuous absence. The act of building a successful water-network was recursively informed by water's capricious behaviour, of which little was known when Alvord initiated the first MuNyanyadzi furrow. Through this first attempt, Alvord and his staff embarked on a process, which they advocated for their African clientele: learning-by-doing. In this case they were learning about the force and behaviour of the Nyanyadzi river, seeking to counter every move of the water by mobilising new allies (cement, reinforced weir, financial resources, labour force), thus expanding the network. Yet, Alvord consistently over-estimated the amount of available water during the dry season, whilst he under-rated the force of storm floods. Thus the first MuNyanyadzi scheme was wiped out by the river's overwhelming force. The big Nyanyadzi scheme was shaped by water's recurrent absence as well as its propensity to deposit large amounts of silt in the canal network. Alvord ultimately failed to secure for the water-network the one element, which could have ended its water woes, the Nyanyadzi dam. In spite of the cult figure status that Alvord has attained over the years in Nyanyadzi, present plot holders still bemoan this one omission from the dream.

This concluding section first presents an outline of the key elements of the modernisation model contained in the dream and cemented by Alvord at Nyanyadzi. Next the eclectic and contingent process of crafting the Nyanyadzi water-network is analysed by examining the alignment strategies, modes of water control and appropriation strategies enacted by the various actors tied to the network. Finally, three key effects that the water-network produced are assessed in terms of their capacity to transform the existing *Ndau* society and landscape.

Outline of the modernisation model in Nyanyadzi: key elements of the dream

This chapter has presented the first two phases in the life of the big Nyanyadzi scheme, which were shaped largely by its most fervent propagator (Alvord). The first phase of actual conception and settlement started in 1937, was more or less secured in 1942, and ended in 1947, when the bulk of the plot holders had settled and the water-network proved capable of withstanding a major drought. During the subsequent second phase the resident LDO and his staff sought to maximise the agricultural output of the scheme, whilst Alvord directed his energies towards realising his vision of a modern self-sufficient community, which would allow the government to withdraw from the project.

²¹ The businesses comprised the butchery of Mukome and store of Goney, a store *cum* tea room run by an autochthonous plot holder (Chikotosa, store opened in 1953), a store run by a retired civil servant who had taken up irrigation (Jambaya, store opened in 1957), and two other stores opened by outsiders. Interview with Luc Jambaya, Nyanyadzi, 7 June 1997, Interview with J. Chikotosa, Nyanyadzi, 7 June 1997.

The key elements of the modernisation model, of which Nyanyadzi scheme became the leading prototype, were similar to those outlined in chapter 2.4 for household and Reserve modernisation and closely resemble the central tenets of the factory scheme paradigm outlined in table 1.1. The average plot holder in Nyanyadzi was a full time irrigator, cultivating 3 acres (1.2 ha) of land according to the stipulated crop rotation, growing enough food to feed two additional Reserve families, and selling surplus and cash crops proceeds on the market. He headed a nuclear family of one wife and several school going children that resided in a modern square house, with well tended garden along a straight road that led to the church that was visited on Sundays. Bride wealth transactions were concluded in money rather than cattle. A small business centre and neighbouring clinic catered for other basic family needs. Within the confines of the scheme, the traditional African leadership played a nominal role. Plots were allocated by the resident LDO, and plot leases extended annually on the basis of water rate payments. Water was distributed to plots rather than to individuals and the canal infrastructure and land was considered property of the government. The only features of Nyanyadzi irrigation scheme which made it deviant of the irrigation factory paradigm presented in table 1.1, was that water was not distributed according to crop water requirements (since water measuring devices were not installed) and that the plot holder was given some freedom to choose the crops he wished to grow.

Thus the model of modernisation contained in the Nyanyadzi water-network reflected the key elements of the model Alvord wished to realise in the African Reserves. But whereas African agricultural practices in Reserves proved quite obdurate, not in the least because of erratic rain fall, the largely empty Nyanyadzi alluvium, introduction of a new technology (irrigation) and the mostly voluntary nature of settlement of inhabitants, presented Alvord with an opportunity to shape the modern, highly productive African community he aspired. Alvord, as key initiator of the network, cautiously nurtured its growth by skillfully crafting a set of interlocking interests, mobilising new resources, and making the most of the unintended effects produced by the network (*cf* Chambers 1969, 244-5).

Alvord was certainly not unique, as is suggested by the prime role accorded to Emile Belimé in crafting the much larger Office du Niger settlement in the French Sudan, and the key role of Giglioli in directing the highly productive Mwea irrigation settlement in Kenya (Chambers and Moris, 1973). All three were men, and all three were visionaries in their own right. Belimé was a French public works employee who projected his grand vision of 1,850,000 ha of irrigated land in the Niger valley, to provide France with raw cotton whilst kick-starting a process of 'civilisation' in the dense settlement thus created. Belimé's dream was launched in 1919, feeble beginnings were made in 1925, and the present Office du Niger settlement started operations in 1932 (after construction of a major diversion dam). The sociotechnical intervention model (*colonisation indigène*) underpinning the scheme shows a striking resemblance to the modernisation packagedevised by Alvord. Critical elements in the model of modernisation were the relocation of settlers in a modern place (characterised by straight roads, villages in lines, and square houses) to provide a radical break with their traditional ways of life; introduction of mixed, plough based farming to revolutionise African agriculture; and the introduction of the modern nuclear household in response to a perceived crisis in African kin-based society (Van Beusekom 1990, 61-85).

There were also differences, particularly in the amount of force applied and the degree of success achieved, both not unrelated to a factor hundred scale difference. The Office du Niger was declared an unqualified failure in 1945 by a government evaluation mission (Filipovic 2001, 259): settlers were heavily indebted, a suitable cotton strain had not been found, and

the project had failed to mobilise sufficient labour, despite the ample use of force. Settlers at the scheme were locally known as *tubabu jonw*, slaves of the white person (Van Beusekom 2000, 83-4). In contrast, Nyanyadzi was heralded as an unqualified success in the same year: the scheme had just returned its first profit, plot holders were gaining in wealth, and the first plot holder committee had just been inaugurated.

Critical in the success of the Nyanyadzi scheme was Alvord's network of Mount Selinda trustees, which he had nurtured himself during his previous career as a missionary. By the time Alvord embarked on the MuNyanyadzi project, he and his team of demonstrators had gained seven years of experience in working with reluctant African cultivators and doubtful administrators. Alvord initially ran his department and Nyanyadzi scheme as a private fiefdom, relying on the loyalty of his modern (Methodist) men, minimising inter-departmental and staff frictions, which beset the Mwea irrigation settlement. The growth of the Save valley water-network and concurrent elevation to departmental status of his staff, forced Alvord in the mid-1940s to take some distance, as most clearly voiced by the resident LDO in Nyanyadzi who started to question the patronising behaviour of some of the Alvord trustees in 1945. The network of mostly Methodist Mission stations in Melsetter district also proved critical in getting the Nyanyadzi water-network filled with entrepreneurial plot holders, particularly in the second half of the 1940s. This first and second generation of mission educated craftsmen and women constituted an essential element of the modern Christian community that Alvord dreamed of.

Crafting the water-network: alignment, control and appropriation

The act of crafting the Nyanyadzi water-network bears little resemblance to the step-by-step execution of a plan contained in some grand design, a common conceptualisation of design and implementation of a project amongst irrigation engineers. The articulation of an irrigation policy and subsequent refinement of technologies of water control by Alvord and his staff was not so much a result of a conscious strategy or 'natural sequence of activities' (Chambers 1969, 219), but rather a response to undesirable outcomes produced by the constituent elements of the network including the users. Alvord gradually increased the management's hold over the network, not by plan, but in response to local events on the ground. He and his staff did so by realigning and re-ordering the social and material elements of the network, thus devising increasingly refined procedures for prescribing, monitoring and directing the behaviour of its critical elements, i.e. water, plot holders and crops. When the plot owners refused to repair the faltering infrastructure, water rents were instituted, in the process transforming Africans into plot holders in a government project. In response to opportunistic millet growing by plot holders Alvord devised the 1939 irrigation policy, further refining their obligations as full-time irrigators. One effect of this ongoing re-alignment was that the network became more distinctive. The Nyanyadzi water-network became a bounded entity, literally fenced off from its surrounding environment, forming a self-contained modern agricultural society that provided an alternative to the traditional African kin-based society.

To effectuate this transformation, Alvord skilfully applied a number of translation strategies, overcoming resisting obstacles (trees, stingy Administrators, doubtful Engineers, reluctant lawyers) and enrolling new elements into the network (cash crops, European supervision, experiment station). Critical in getting started was the presentation of the project as a future cash-saver on famine relief expenditure and the, erroneous, assumption that the Nyanyadzi river was a reliable partner, whose use did not compete with European interests. Yet the biggest balancing act was performed in 1942, after the MuNyanyadzi scheme had been flushed out and plot holders threatened to leave the scheme on account of high water rents.

By introducing new crops, a new marketing arrangement and the departmental growing of fruit trees, Alvord managed to turn the scheme into a profitable proposition for both hungry and entrepreneurial plot holders *and* the government.

The MuNyanyadzi scheme was limited in scope and nature, relying on locally available human and natural resources. The later Nyanyadzi water-network involved the mobilisation of resources beyond the local arena, expanding the scope of the network and linking it to regional and (inter)national actors, markets and knowledge sources. Whilst these linkages allowed the water-network to grow and stabilise over time, they also introduced new dependencies which inhibited its capacity to stand alone and called for more refined technologies of control.

By 1945, the scheme seemed ready for the withdrawal of government supervision. According to Chambers (1969, 214) the withdrawal involved two concurrent trends:

'specialisation in which management and settlers, while concentrating on economic matters, call in specialised organisations to service a scheme; and devolution in which management hands functions over to settlers.'

Yet, whilst Alvord was instrumental in the formation of the first plot holder committee in September 1945 and firmly in favour of handing over the departmental marketing scheme to an African co-operative society, the withdrawal did not occur. Three recursive trends informed the subsequent increase of government control over the water-network.

Firstly, the Agrícolas organised in the newly formed Department of Native Agriculture considered government supervision essential in increasing the agricultural productivity of irrigation schemes. This dogma had been created by Alvord himself: he often ascribed the success of his demonstration work to the close supervision provided by demonstrators. Furthermore the rise to prominence of the NRB and conservationist concerns within Rhodesia's government bureaucracy, legitimised such supervision. Frustrated by the lack of success in transforming rain-fed agriculture in the Reserves, Alvord contributed to this trend, which culminated in the passing of the Good Husbandry Act (1948) and NLHA (1950). A final founding stone of the dogma was ascribed to the nature of irrigation itself, which legitimised specialised forms of co-ordination that drew on engineering and agronomic expertise. This 'innate' relationship between irrigation and the enforcement of strict disciplinary supervision is quite universal, as shown by Wittfogel (1957). For instance, the success of the Mwea rice settlement in Kenya was largely ascribed to the so-called 'Mwea system of strict managerial control' (Clayton 1981, Giglioli 1973, Veen 1973).²²

Secondly, Alvord's attempts to realise his vision of community development in Nyanyadzi resulted in a top heavy staff complement, which pushed the scheme's accounts into the red figures. The school of agriculture, establishment of the experiment station and skilled expertise required to establish agro-industries, all contributed to this heavy drain of government resources in Nyanyadzi. This in itself produced two effects. One was that Administrators pushed for increased cost-recovery, either through hikes in water rents or through levying crop returns. A second was that devolution of the management of the scheme to the plot holders could be postponed, since financial autonomy was posed as the prime condition for such a hand-over.

²² Chambers (1973b) questions this myopic focus on discipline amongst Agrícolas, by contrasting Mwca's success with the dismal failure of the Perkerra irrigation settlement, where the Mwea system of supervision was also applied.

Thirdly, Administrators were extremely reluctant to allow the development of African entrepreneurial activity. They feared the growth of an African elite in irrigation schemes, since such an elite was inimical to the ideal of gradual, egalitarian development of the African people (see Keigwin, chapter 2.1). Thus the Administrators were critical in postponing the establishment of African businesses on the scheme and the formation of the Nyanyadzi co-operative society.

Irrigation and its effects on Ndaui society: eradication of famine and concentration of wealth

The establishment of the Nyanyadzi and Save irrigation settlements produced a number of fundamental effects on their environment, in the process transforming some of the modalities of Ndaui society and the existing landscape. Its most cherished effect amongst government circles was the 'eradication of famine' in the arid Save valley by the end of the 1930s.

Increasingly trade with the irrigation projects replaced the barter trade between low veld and highland Ndaui communities. The modalities of the barter trade also shifted from the traditional exchange of salt, fish, mats and baskets produced in the low veld for grains produced in the highlands, to an exchange that involved cattle and cash generated through labour migration for grain produced in the irrigation schemes. This change in the modalities of the barter trade cannot solely be ascribed to the emergence of a network of irrigation schemes. Increased exposure to the world economy and the effects of other government interventions, such as the (delayed) implementation of the Land Apportionment Act, which was partly facilitated by the new irrigation settlements, also played a role in destroying the indigenous system of coping with droughts. Expansion of cultivated areas and hunting as a source of protection against famine became increasingly more difficult, whilst the implementation of the Water Act halted prevalent practices of wet land cultivation (*matoro*). The Save irrigation settlements were fundamental in stopping the nascent spread of African initiated irrigation furrows across the Melssetter mid- and high velds (see chapter 9). Furthermore, the world depression of the early 1930s combined with outbreaks of foot-and-mouth disease resulted in serious price drops for livestock, aggravating the effects of drought.

The rapid succession of droughts in 1933, 1934, 1938, and 1941 affecting the Save valley coincided with the growth of the irrigation network. Whilst these droughts allowed Alvord to mobilise famine relief funds for their construction and helped in getting the irrigation settlements filled with plot holders, the sale of irrigated grain also resulted in a transfer and concentration of wealth from the surrounding dry land into these densely populated irrigation settlements. This transfer of wealth produced a number of ramifications, which were deviant of national trends. For instance Iliffe (1990, 10-11) notes a shift in the effects and character of famines that occurred countrywide after the famine of 1922. Whereas previous famines mainly hit those areas least affected by colonial interventions and resulted in massive suffering amongst Africans across the board, later famines were most severe in those areas most affected by colonial interventions and capitalist in nature, i.e. affecting mostly the poor and destitute amongst the African populace. Surviving famines became a matter of buying power differentials. Those with cattle herds or cash proceeds from migrant labour employment could afford to buy grains from European traders, whereas those without depended on government provided food-for-work programmes, if any were provided. In the Save valley, hungry dry land farmers bought their grain from irrigating Africans or else offered their labour to these irrigators in exchange for green mealies. Ultimately they might even consider taking up an irrigation plot themselves. But in places where irrigation

settlements were distant, such as Musikavanhu Reserve in 1941, these options did not exist and massive poverty was the result.

In those Reserves with irrigation settlements a transfer of wealth occurred from Africans practising rain-fed agriculture to irrigating Africans rather than to European traders or the government. Alvord's resistance against transforming Nyanyadzi scheme into a commercial government estate was instrumental in securing the basis for such wealth accumulation by African irrigators. The agricultural wealth and hub of activities in Nyanyadzi attracted new African entrepreneurs and professional workers to the scheme and soon resulted in new aspirations. However, administrators, fearful of the dangers associated with individual enterprise, were reluctant to meet these aspirations as is shown by their refusal to grant more business licences in Nyanyadzi. The growth of a relatively wealthy African elite in Nyanyadzi and the frustration of their entrepreneurial efforts would prove influential in the years to come, contributing to African nationalist inspired resistance in the early 1960s. Another effect of the transfer of wealth was the concentration of livestock on irrigation settlements, which in turn created pressures on the surrounding grazing areas. This would prove a pernicious problem associated with irrigation settlements during the implementation of the Native Land Husbandry Act after 1950.

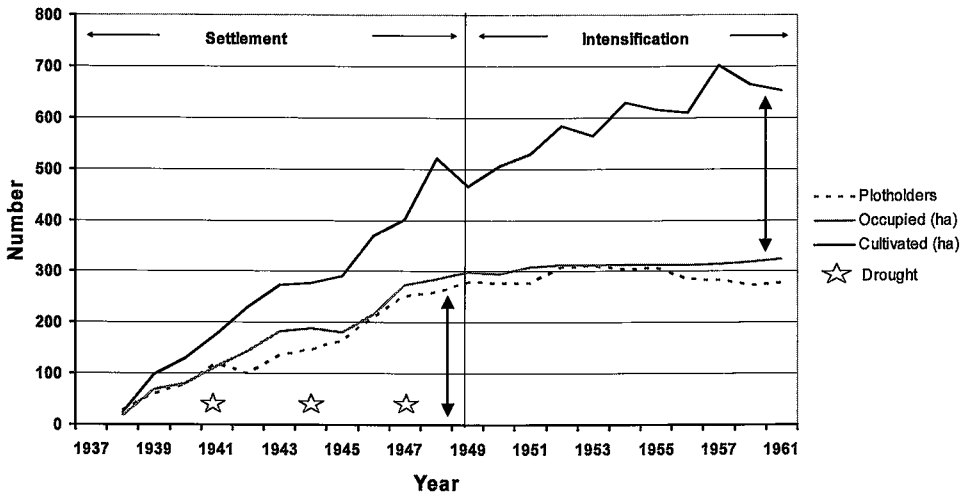


Photo 7: Siphon irrigation in Nyanyadzi, March 1972
(Source: D.C.H. Plowes photo)

THE SCHEME: THE ROAD TO AN IRRIGATION FACTORY

By the time Alvord left the scene, Nyanyadzi scheme had more or less taken its present shape. In 1951 the fourth block (D) was opened up and for the first time the Director of Native Agriculture could report on 'waiting lists of prospective plot holders' for all Save valley irrigation schemes.¹ Having secured the goal of irrigated food production as a means of famine relief in the arid Save valley, three sets of government actors (Engineers, Agricolos and Administrators) set out to modify the water-network to attain other goals. In Chambers' (1969) phased trajectory of schemes' development the phase of settlement had been concluded in Nyanyadzi, opening the door for Agricolos to intensify and diversify its agricultural output, in order to allow for a withdrawal of the government. The arrows in graph 5.1 clearly indicate this shift of direction from maximisation of settlement (1937-49) to maximisation of production (cultivated area) after 1950.

Graph 5.1: Development of Nyanyadzi irrigation scheme, 1937-61



The Engineers, represented by the Irrigation Department and later the Department of Water Development (DWD), set out to improve the physical control over water flows. Flood protection works, night storage dams, and ultimately pumps were installed to get to grips with the most unreliable element in the water-network, i.e. water itself.

The Agricolos, represented by the resident Land Development Officer (LDO) and his staff, were at the helm of agricultural interventions in the period 1950-67, epitomised by the implementation of the Native Land Husbandry Act (NLHA). For Nyanyadzi scheme this meant the management embarked on a programme of maximisation of production per unit of

land in an environmentally and economically sustainable manner (5.1). Initially the focus was on intensified production, which was essentially a matter of applying sufficient supervision in the eyes of the Agricolas. The NLHA assessment (1954) and proclamation (1956) of the scheme shifted the focus to achieving integrated crop-livestock farming on the basis of economically viable holdings. Implementation of the NLHA in Nyanyadzi was however stalled and made dependent on an economic evaluation of the African irrigation schemes. The latter evaluation directed attention to further diversification of the cropping pattern towards marketable crops. When a local fruit processing plant finally produced a leap in economic wealth (1957-61) the intertwined issues of cost recovery and user management came to the fore once more.

Finally, the Administrators, represented by the Native Commissioner¹ and his superiors, increasingly saw irrigated settlements as means to relieve population pressures in overcrowded Reserves and places of resettlement of African families that had been expelled from European areas. Thus Administrators were after maximisation of settlement per unit of irrigated area, embracing a kind of egalitarian and paternalistic ideal of African development. The outbreak of nationalist inspired violence in the early 1960s threatened to shatter this ideal (5.2) and ultimately led to the forceful return of the Administrators on the irrigation front, seeking to control African nationalists by enforcing strict managerial supervision on the schemes after 1967 (5.3). Thus Nyanyadzi scheme was transformed in a proper irrigation factory. During the ensuing war of independence the scheme and its inhabitants became part of an intensive war zone, forcing the management to relax some of its regulations and culminating in the closure of the scheme (5.4).

5.1 THE AGRICOLAS' SCHEME (1950-1967)

Making the scheme waterproof

The Nyanyadzi water-network required almost continuous tending by its propagators. Either water was short, particularly towards the end of the dry season and the start of the wet season, or else an abundance of water, in the form of storm floods in the river and flash floods in (otherwise) dry water courses crossing canals and plots, threatened to wipe out parts of the network. To control the water flows both towards and inside the network, various remedies were tried. These remedies each involved the addition of new material elements that presented both added costs for construction and maintenance *and* new dependencies on outside agencies and resources.

Improving internal water efficiencies

Two obvious means of increasing the water supply to the scheme, a large dam on the Nyanyadzi river and lining of the main canal,² were suggested by both the new Director of Native Agriculture and the assistant CNC, as early as 1951.ⁱⁱ These missing elements were to remain on the charts, re-surfacing in conjunction with plans for expansion after 1967. Initially, the huge costs involved proved prohibitive.

In absence of these preferred solutions, the engineers focused on improving the efficiency of water use inside the network by constructing night storage dams (NSD) within the scheme. In 1949 the big NSD was completed, holding some 33,750 m³ or 36 hours of righted river

¹ After 1967, NCs were renamed District Commissioners (DCs), whilst Reserves became Tribal Trust Lands (TTLs).

² Some 50% of the water taken in from the river was lost before reaching the block C branch canal (Roder 1965, 147).

flow.ⁱⁱⁱ In 1953 a second NSD was added, containing some 9,000 m³.^{iv} Thus the night flow of the Nyanyadzi river could be captured, alleviating immediate stresses on water supply.³ Yet the storage dams provided no answer to the structural water scarcities that were experienced. Moreover the excessive amount of silt load in Nyanyadzi river water resulted in gradual choking of the NSDs. The silt had to be removed on a regular basis, putting a strain on the scheme's finances. Another way of improving water efficiencies inside the network was to line the branch and lateral furrows of the expanding network of canals.⁴ This activity was undertaken incrementally throughout the 1950s and 1960s, covering one or two kilometres annually, occasionally interrupted by shortages of funds.

To facilitate greater control over water distribution among plot holders, the management placed more furrow gates as well as ten measuring devices (flumes) in 1953.^v The latter were prone to siltation and provided no accurate insight into water flows. Two other measuring devices (Parshall flumes), installed in 1958, were still awaiting calibration in 1960, when a CONEX irrigation officer on tour in African irrigation schemes noted to his dismay that his counterparts in African Agriculture had no clue of the amount of water used in their schemes.^{vi} The Provincial irrigation officer explained that besides daily pump records in pump schemes, no useful data could be obtained for gravity schemes, unless an extensive network of automatic flow recorders was installed. The complexity of seepage and evaporation from night storage dams and intermittent water flows throughout such gravity schemes, precluded simple measurements.^{vii} Further attempts to improve field water application rates involved the levelling of plots in straight border strips and a suggestion in 1951 to introduce syphon irrigation in the new block D.⁵

Finding new water for the scheme

Ways of increasing the water supply to the scheme comprised the construction of a raised weir wall on the Nyanyadzi river in 1955^{viii}, plans to divert water from the Odzi river through pumps, as well as attempts to sink tube wells in the Save river alluvium to tap groundwater, in 1960. The latter proved infeasible, since no large underground supply of water was available.^{ix} Water shortages in 1952 and again in 1954, urged ID engineers and local management to focus increasingly on the construction of a pumping plant on the Odzi river, the only remaining option for augmenting supplies.

In December 1953 the first tender for four pumps capable of supplying some 40 l/s each was published. In January 1954 the tender board recommended its choice and the pumps and engines were acquired.^x However, by May 1954 it became clear no allocations were made in the 1954-55 annual budget for the Odzi/Nyanyadzi pumping plant.^{xi} Since the plan involved considerable re-alignment of existing canals in order to command some 100 hectares of existing plots in blocks A and B and some 50 hectares of new plots in block E, substantial additional funds were required, besides those spent on the pump plant itself. The Provincial Native Commissioner noted that block E was essential to resettle 37 African families that had been expelled from European farms in Chipinge and urged the ID to consider re-allocating funds.^{xii} The ID, however, put the blame for the delay on the Native Agriculture Department

³ Alvord had tried to introduce night irrigation with help of floodlights during the late 1940s. The plot holders, however, despised irrigation at night, and the effort was abandoned.

⁴ Canal lining also helped to reduce the number of *Bilharzia* snails. The disease was successfully fought in the 1950s by the application of chemicals to the canal water and treatment of infected persons (Roder 1965, 150-2).

⁵ Water application by means of syphons required sufficient hydraulic head in the feeder furrow. Such head was only available after another major rehabilitation of the canal network in the early 1970s.

that had failed to clear the riverine bush in the future block E area.^{xiii} Finally in August 1954 the provincial irrigation officer put the ball back in the court of the PNC, pointing out that the NLHA assessment committee had recommended a uniform land allocation of 3 acres for food crops and 1 acre for irrigated pasture per family in Nyanyadzi. Thus the enforcement of the NLHA in Nyanyadzi hinged on either deprivation of 21% of the plot holders of their land or an additional 271 acres brought under irrigation. The latter was only possible if additional pumping was provided, for which the PNC was urged to make 'strong representation'.^{xiv} However, the next annual budget (1955/56) again failed to produce the required £4,500, despite initial inclusion.^{xv}

In April 1956 a second attempt was made to get the pumps on the ground. This time block E was excluded from the plans, though extension of block D would be facilitated by the 4 pumps capable of augmenting supplies with 120 l/s.^{xvi} The 1956/57 budget allocations were re-shuffled to muster the £7,000 required.^{xvii} A looming water scarcity in February 1957 provided further impetus. Further delays, due to a motor accident and faulty pump fittings, and additional funding requirements (to the extent of £2,400) resulted in the pumping scheme being operational only by December 1957.^{xviii} The construction of the plant was a complicated affair, involving the pushing of water in reverse direction along the western edge of block A, resulting in the complex canal network that Nyanyadzi still is. The complexity of the network is reflected in the fact that water can reach block B via three different routes, from two different sources.

The running of the diesel engine pumps was an even more complicated affair, requiring timely provision of diesel, regular repairs, construction of gabions in the Odzi river bed to lead water to the pump sump in times of drought, and complete overhauls after submersive floods. The repair of the pump plant after the 1962/63 flooding took some three years^{xix} at the cost of £4,600. Even when the pumps were operational, they often failed to deliver the design discharge due to increased wear and tear caused by Odzi river water silt loads.^{xx}

In addition to the damage caused by storm floods in the two major rivers, the Nyanyadzi network suffered from canal blockades and flushing out of plots, by flash floods originating from the extensive grazing areas east of the scheme's perimeters (Roder 1965, 147-9). The two dry water courses traversing block B necessitated construction of extensive drainage works in 1957 and a large storm water channel cutting the block in two, in 1962.^{xxi} Thus excess water continued to throw sand in the system, requiring continuous mobilisation of labour from both the maintenance gang and the plot holders to keep the network operational.

Making the scheme viable

Throughout the 1950s and 1960s the total staff establishment of Agrícolas at the scheme consisted of one European LDO, one African supervisor and four agricultural demonstrators (one for each block), who directed four water bailiffs (one in each block) and the maintenance gang. To increase the agricultural output the LDO and his team exercised the 'strictest control over the plot holders' insisting on the 'manuring of lands, planting dates, row irrigation and communal watering'.^{xxii}

The annual report of 1951 mentioned a doubling of maize yields at Nyanyadzi over the preceding three years. This stunning feat was attributed to the close and constant supervision exerted by the LDO.^{xxiii} The report failed to mention the influence of the use of an improved maize variety in 1950 and the introduction of hybrid maize in 1951 (see table 5.1). Yet it was the hybrid maize that produced a lasting yield hike from around 2 tons/ha in the 1940s to

around 4 tons/ha in the 1950s (see graph 5.2). When in 1955 total yields on African irrigation projects rose by another 33% over the previous year, and maize in particular by 43%, the increases were attributed 'partly to more favourable climatic conditions, but mainly to closer supervision and more rigid enforcement of regulations regarding the application of compost and manure.'^{xxiv}

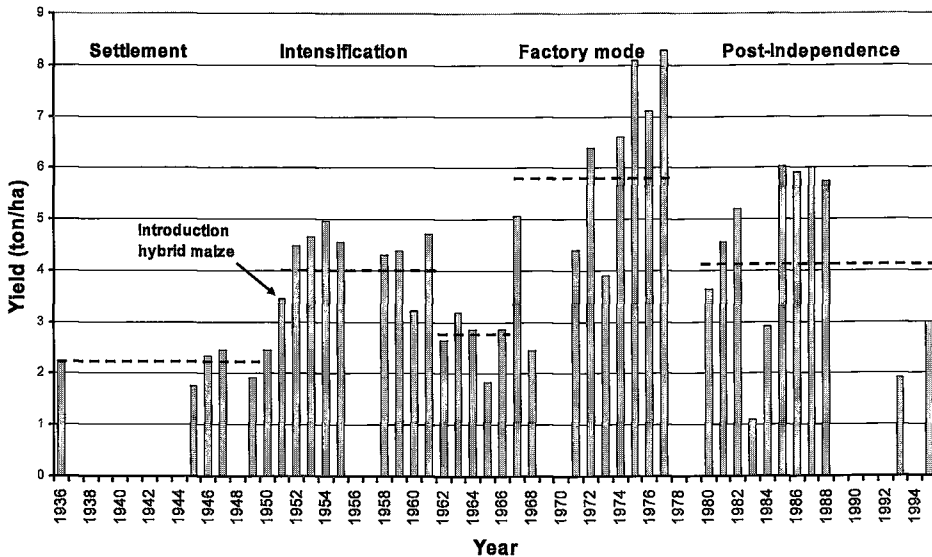
Table 5.1: Maize acreage, yields and varieties at Nyanyadzi, 1949-52

Year	Acreage (acres)	Yield (ha)	(bags/acre)	(ton/ha)	Maize variety
1949	590	238.5	8.3	1.9	open pollinated maize
1950	551.5	223	10.8	2.4	Hickory King (improved open pollinated)
1951	622	251.5	15.2	3.4	Hybrid maize
1952	703	284	19.7	4.4	Hybrid maize

Source: Annual reports of the Director of Native Agriculture.

Another effect of enforcing strict supervision was that many plot holders, particularly the 'uneducated', tended to regard 'themselves almost as employees of a plantation working for a boss, and are afraid of being kicked off their land if they do not follow orders' (Roder 1965, 172). Even after widespread African resistance against the NLHA in 1960-61, and subsequent parliamentary recommendations to separate regulatory powers from extension services, the LDOs operating in irrigation schemes were convinced that more, and not less, compulsion was needed to attain agricultural success (Roder 1965, 173). Thus the LDOs were of the same opinion as a government economist, who had earlier singled out the 'provision of close supervision' as key to further yield increases (Hunt 1958, 2). Another independent researcher observed that Nyanyadzi scheme, though successful, still fell short of its 'full potential'. The shortfall originated in his view from 'human' rather than natural or technical factors: African plot holders needed to be persuaded to abscind their preference for 'subsistence' and 'leisure' and henceforth practise what they were being taught by the LDO and his staff (Gregory 1967, 93).

Graph 5.2: Average maize yields (ton/ha) and trends in yield levels in Nyanyadzi, 1936-95



Halted implementation of the NLHA in irrigation schemes

The mainstay of rural agricultural intervention in the 1950s was the NLHA, which aimed to remedy all ills of African agriculture by enforcing two fundamental shifts. Firstly, traditional land tenure sanctioned by headmen and chiefs was to be replaced by a system where the government allocated to individual households, farming and grazing rights, which were inheritable but could not be sub-divided below a certain minimum acreage (6 acres in dry land areas). Secondly, the government would supervise and enforce sanctioned practices of crop and animal husbandry in order to conserve and, if necessary, regenerate the land base in the Reserves. Overall the Act aimed at creating a class of small landholders with a permanent interest in their piece of land, embarking on commercial agriculture. The superfluous, landless Africans that would thus remain were to be absorbed in the expanding labour market provided by the urban industries, mining concerns and the European farming sector (Floyd 1959, Roder 1965, 134).

At first glance it seemed African irrigation schemes were front-runners of the new policy, having achieved both shifts stipulated by the Act (i.e. government allocation of plots and enforcement of farming practices). Yet the 1954 NLHA assessment of irrigation schemes brought two urgent problems to light: that of overgrazing around the schemes, and the sub-division of irrigation plots below the threshold of economic viability (Alexander 1993, 55). Regarding the latter, the top provincial Agricola reported that in Nyanyadzi 171 plot holders out of a total of 275 held two acres or less of irrigated plots. Only 86 plot holders farmed on holdings of four acres.^{xv} It was assumed that this situation had been created by administrative pressures in the past to resettle as many displaced Africans from European farms as possible. To tackle both the problems of overgrazing and uneconomic holdings the NLHA assessment committee suggested to allocate holdings of four acres only, consisting of three acres of food and commercial crops and one acre of grass-legume pasture. Furthermore the schemes and their grazing areas had to be fenced, so as to cut them off from neighbouring dry land economies. For Nyanyadzi it was proposed to deprive 67 widow farmers, holding less than two acres each, of their plots, whilst expanding the scheme with the help of a new pumping plant in order to allocate 4 acres to all remaining (male) plot holders (see above). Subsequently in 1956 all irrigated areas were proclaimed under the NLHA, though their application was held up nationally pending an economic evaluation of irrigation schemes (Alexander 1993, 55).

Diversifying the cropping pattern: the search for viable markets

The over-production of maize in the colony by the mid-1950s combined with official concerns over the economic viability of African irrigation schemes led to a renewed search for commercially rewarding crops. Sunnhemp production, previously so rewarding, became unprofitable and petered out in the mid-1950s. Onions were tried in 1954 in other Save schemes, but the production quickly saturated urban markets. The same fate awaited the production of peas (Roder 1965, 128). Thus diversification of the cropping pattern proved difficult, and mainly a matter of finding a suitable market outlet nearby to economise on transportation costs (Ibid., 131).

Such an outlet was finally provided in 1957, when the Liebig's canning company opened a subsidiary processing plant in Cashel, Melssetter district. Various types of vegetables, such as onions, carrots, cauliflower, sweet corn, peas, tomatoes and beets suddenly found a guaranteed market, though only green beans proved financially rewarding in the end. The canning factory also introduced a new mode of production: contract cropping. The contracts were negotiated by the scheme's management and the company, involved guaranteed prices

and proved quite rewarding for the plot holders. Yet, the handling and transport fees resulted in a marked price difference between vegetables grown under contract and vegetables sold on the road side or brought to the Umtali green market by private means. Thus the LDO was forced at times to pressure plot holders to deliver their crops, in order for the scheme to fulfil its contract quota. In 1961 the Cashel plant was closed again, resulting in steep price declines on account of increased cost of shipping the produce to the company's Umtali branch (Ibid., 128). By that time it transpired that the very opening of the Cashel subsidiary plant had only been a move of the Liebig's company to push their main competitor out of the market. Upon achieving their aim, the company retreated, ending what is commonly known among older Nyanyadzi irrigators as 'the heyday of the scheme, with fat paychecks delivered at the local post office'.

Other new crops that were grown under contract for Liebig's competitors in Umtali were kenaf (for seed and fibre) and sesame seed. However, both companies ceased their operations in one or two year's time. A more lasting crop was cotton, which was introduced in 1958 after the Save valley experiment station had identified suitable insecticides. Production of bean seed under contract was started in 1959 and proved lasting, despite the high labour demanded to sort the seeds by hand (Roder 1965, 129). The production of these crops certainly benefited from local crop trials on spraying, fertilising and spacing, undertaken at Nyanyadzi experiment station.^{xvi} Local experiments with the growing of burley tobacco resulted in a promising start in 1962/63. Six acres of this highly rewarding crop were grown in the next year, giving a gross return of £209 per acre.^{xvii} However, the crop fell victim to nationalist inspired intimidation of plot holders who followed government extension advice (Reynolds 1969, 12).

Official concerns over economic viability

The economic investigation that had held up implementation of the NLHA in irrigation schemes was undertaken in the 1956/57 season, i.e. before the opening of the Liebig factory in Cashel. Hunt (1958, 1) evaluated net returns of plot holders in seven irrigation schemes and concluded that surplus was only generated in Nyanyadzi blocks A, B, and D. In block C and the other schemes plot holders broke even or suffered annual losses, if charges for family labour and water were factored in. This implied that irrigation plot holders outside Nyanyadzi attained lower living standards than they could have had if they were employed as labourers on European farms.⁶ Hunt (1958, 6) also noted a sharp difference between economic returns attained by plot holders with land holdings of 4 acres (£81 in block D) and those with holdings that comprised 2 acres or less (£26 in block D). The difference was not caused by a difference in output per acre, but by a lower labour productivity.⁷ Most of the female plot holders, who in Nyanyadzi made up 20 to 25% of the total plot holders,⁸ occupied 2 acres or less. These, Hunt suspected, were not widows or divorcees, the only women allowed land holdings under the NLHA, but often involved wives of irrigating husbands, who thus farmed

⁶ Roder (1965, 167-69) disputes these figures. Methodological flaws in gathering the economic data from plot holders, combined with an optimistic scenario for European farm workers, may have resulted in under-estimation of gross irrigation incomes and over-estimation of the net incomes of farm workers.

⁷ The difference in labour productivity and resulting income is caused by Hunt's factoring in of labour as wage labour costed at the price of the minimum wage.

⁸ Nyanyadzi had the highest proportion of female plot holders of all examined irrigation projects. Women comprised 19% (block A) to 26% (block C) of the total number of plot holders in Nyanyadzi, against only 3% in Tawona (the lowest score, and most recent project), and 17% in Mutambara (the highest score outside Nyanyadzi, and oldest scheme). Roder (1965) attributes the high proportion of female plot holders in Nyanyadzi on the lack of interested plot holders in the early history of the scheme. Alvord might have allowed more women in the scheme to foster its growth.

more land than they were entitled to. Hunt recommended a re-examination of the rights to hold land of female plot holders, envisioning great productivity increases in case women were expelled as landholders.

Hunt's findings led to an immediate halt on construction of new African irrigation projects, and informed the 1961 Irrigation Policy Committee for African Areas. This Committee considered that there was sufficient land in the Reserves to enable economic advancement of its inhabitants 'without the need of subsidised irrigation' (quoted in Reynolds 1969, 10). The Committee further condoned the halt in new irrigation projects 'unless there was evidence that they would soon be capable of covering the maintenance costs and of servicing the capital outlay' (quoted in Reynolds 1969, 11). Had the Committee based its findings on the extensive wealth surveys undertaken by Wolf Roder in 1961, its recommendations might have been different.

Roder (1965, 171) found that on average, the new cash crops grown for the Liebig's factory had contributed to increases of incomes per plot holder in the order of £30 (a 22% increase over average incomes in 1957). The median incomes per plot holder (table 5.2) exceeded the median incomes of urban African families in Umtali and Gwelo at the time. Overall women plot holders were less wealthy than men. Irrigated plot holders in Nyanyadzi were twice as wealthy as their dry land counterparts in neighbouring Gudyanga.

Roder also looked beyond monetary income, drafting an index on other forms of wealth, such as type of housing and livestock holdings. In Nyanyadzi 86% of all male and 73% of all female plot holders lived in brick houses. In the neighbouring dry land area of Gudyanga only 6% of the cultivators lived in brick houses, the majority staying in mud-and-pole huts. The average plot holder in Nyanyadzi owned some 5.7 livestock equivalents⁹ against 7.8 possessed by their Gudyanga dry land counterparts. Furthermore plot holders in Nyanyadzi hired considerable amounts of labour and predominantly invested their wealth in other commodities than cattle, both considered features of modern society.¹⁰ Thus it seemed that Alvord's ideal of crafting a modern African agricultural community was being fulfilled in Nyanyadzi in the early 1960s.

Table 5.2: Median incomes at Nyanyadzi, 1961-62

Size of Holding (acres)	From land in cash £	From land in kind £	From road-side market £	From employment £	Gross income £	Adjusted gross income £	Equivalent in heads of cattle (no.)
1-2.75	45	46.5			111.5	100.5	8
3-6	85	101			203	186.5	15
1-6	60	71	71	45	152	136.5	11

Source: Roder (1965, 170). Last category added by me. The adjusted gross income equals gross income minus cash expenditure for hired labour and water.

⁹ A livestock equivalent or LSE, comprised one head of cattle, or five sheep/goats.

¹⁰ Roder (1965, 165-7) found that the Nyanyadzi community was the most modern of all irrigating communities. In Mutema and Devuli schemes, plot holders invested predominantly in livestock (and wives), a practice, which was dubbed traditional. Equally in Mutema Roder found bridewealth transactions still involved cattle, whereas in Nyanyadzi these transactions were monetary.

Feeble attempts at involving the plot holders in the management of the water-network

Another ideal of Alvord, that of self-sufficient communities managing their own affairs, was also given new impetus at Nyanyadzi. The African Water Supplies Committee of 1955, a precursor to the 1961 Irrigation Policy Committee, had already paved the way for irrigation schemes to be taken over by 'the land occupiers on a communal basis' when contribution rates were adequate to cover their operation and maintenance. The contribution of the plot holders was ideally levied 'in terms of quantitative charges for water'. As shown above, the latter demand could not be met since water measuring devices were lacking in Nyanyadzi. The former demand of meeting maintenance charges was seriously impaired by the new Odzi pump station.

Yet, some attempts at increased user participation did materialise by the end of the 1950s. In 1958 the Nyanyadzi kraalhead committee was formed as a consultative body mediating between the management and the plot holders. The committee administered scheme by-laws that endorsed the principles of the 1948 irrigation policy. The four kraalheads residing in Nyanyadzi irrigation scheme were all members of the committee. Besides instilling discipline, the kraalheads would inform the LDO of what the plot holders wanted, whilst the LDO used the committee to communicate and explain to the plot holders whatever decisions the management had taken. The direction of flow was however pretty much one way, as transpires from the following quote of the then Provincial Agriculturist for Manicaland, Mr Plowes:

'You always consulted with people, even if they might not have been able to amend what was going to be done, at least they had the opportunity to know what and why and for their say. And, you know, if they had any really valid objections, we could discuss them and tell them what's up.'^{xxviii}

Plowes indicated he would have preferred a much broader based committee, comprising of businessmen, school teachers and church people. This only happened after 1968, when the four kraalheads appointed two secretaries each to represent them. Amongst these secretaries were leading farmers, ex-teachers, businessmen and church people, some of whom also happened to be the leading African nationalists in Nyanyadzi.^{xxix}

Another form of user involvement was initiated in 1959, when the Nyanyadzi producers' co-operative society was established. In their second year of operation a majority of plot holders had registered as coop members, paving the way for a wholesale take over of all marketing responsibilities for the scheme (Roder 1965, 129). The co-operative operated under the guidance of the Government co-operative Officer in Umtali. It was responsible for signing crop contracts with interested companies (i.e. for beans, seed beans and cotton), distributing seed that was issued under these contracts, collecting and registering produce, and issuing pay checks to individual producers via a bank account at the local Post Office.^{xxx} Over time the functions of the co-operative expanded to include the bulk purchase of maize and cotton seed; provision of loans for fertilisers, seed and agricultural equipment; and provision of the equipment, insecticides and labour for cotton spraying under the guidance of local extension staff (Gregory 1967, 91).

Following the denouncement of paternalistic policies after the nation-wide revolt against the NLHA, CONEX took over the management of African irrigation schemes and introduced 'management committees' in each scheme in 1963. The purpose of these committees was:

'to foster an interest among the irrigators in the problems that arise in the efficient operation and maintenance of the scheme, to bring about an appreciation of the economic need for the higher paying cash crops and the general need for a more efficient approach to irrigation farming, eventually leading to these schemes being operated on a community development basis.'

And so it seemed an irrigation management turnover from government to the users was in the air. However, events during 1964 and after led to a different outcome.

Making the scheme sustainable: integrating livestock

Besides the 'human factor' Agrícolas were equally obsessed with the 'animal factor' threatening the success of irrigation schemes. The problem with livestock in densely populated irrigation settlements was that whilst cattle were essential in providing draught power and manure, the grazing areas surrounding the irrigated perimeters were often 'overstocked', causing an erosion menace that threatened to choke and wipe out parts of the water-network. The problem was further compounded by the very success of irrigation, resulting in wealthy plot holders who invested in even more cattle. Roder (1965, 186) even argued that the prosperity of irrigation was in part a result of the gradual destruction of the surrounding grazing area, since cattle have a propensity to transfer nutrients (manure) from grazing to arable lands, rather than add nutrients to the area as a whole.

The Agrícolas running the schemes tackled the problem in typical technocratic fashion producing reports full of figures and calculations on carrying capacities and average requirements for draft power and manure per irrigated acre. The Provincial Agriculturist calculated that each plot holder required at least two oxen for draught purposes (Plowes 1959). However, since major ploughing chores occurred at the end of the dry season, when the animals were in a weak condition, another four draught animals were required on stand-by. Introduction of tractor draught power proved infeasible, since the running costs resulted in higher ploughing charges per acre than hiring local oxen.¹¹ For purposes of manuring one cow per acre was required, and in case of year-round cultivation two cows per acre (Roder 1965, 181). However, such allowances would pose enormous pressures on the surrounding grazing area. As a result the Agrícolas resorted to composting as an alternative source of fertilisation in the mid-1950s.^{xxxii} Composting required quite some labour, making it unpopular among plot holders, who also regarded compost bad quality manure. The only other alternative available was the application of artificial fertilisers, which were still expensive in the 1950s (Roder 1965, 180-1).

Thus solving the puzzle of conservation, irrigated production and livestock holdings proved complicated, confronting the Agrícolas with difficult choices. The conventional solution dictated by the NLHA comprised the politically risky option of compulsory destocking, which was not implemented in irrigation schemes, except for the community run Nyachowa scheme. To improve pasture land, grazing areas were fenced off and paddocks made to practise rotational grazing. This option was only tried in Nyachowa and Mutambara, since the other schemes were located in the hot and arid Save valley, where pasture regeneration took too long. The only option remaining was to 'integrate livestock and irrigated production', either by irrigating pasture land or stall-feeding livestock on crop residues and irrigated fodder crops. The latter option was proposed in the NLHA assessment, which allocated 25% of the irrigable land to grass-legume pastures. Experiments with lucerne and starr grass as well as family unit irrigation of integrated crop-livestock production were undertaken at the Nyanyadzi experiment station.^{xxxiii} In the end no pasture crop was included in the irrigation rotation, because of the loss in economic returns this would present to the plot holders. Stall-feeding with crop residues proved a viable option only for pigs, and took a great flight in

¹¹ One plot holder in Nyanyadzi used a light tractor to offer plough services at £1 per acre. Since ploughing with hired oxen cost about £0.625 per acre tractor services were only in demand during peak seasons (Roder 1965, 180).

1962 at Nyanyadzi.^{xxxiii} However, pig production, as elsewhere in the world, was susceptible to fast boom and bust cycles. By 1964 the market was flooded and production slumped again.

By 1961, calculations showed that the grazing area in Nyanyadzi was overstocked to the extent of 10 times its carrying capacity (Roder 1965, 177). Yet, no major livestock starvation occurred at Nyanyadzi. How did livestock survive then? Basically a combination of riverbed reeds, good quality browse in the arid Save valley, and prevalent practices of crop residue feeding saved the day for many cattle. In addition, Nyanyadzi plot holders practised a system of cattle migration, sending them to graze across the Save/Odzi river in the sparsely populated Bocha area. Though officially prohibited, the management condoned the migrations, since no alternatives were available and destocking would meet fierce resistance (Ibid., 178). The absence of cattle starvation also questions the validity of the calculated carrying capacities.

5.2 NATIONALIST SURGE IN NYANYADZI (1958-1964)

The massive outbreak of nationalist inspired violence and intimidation in 1960 was directed against government staff implementing the NLHA and those African cultivators following their agricultural advice, i.e. master farmers. These expressions of African discontent erupted, whilst the government of Southern Rhodesia was discussing and promoting the idea of racial partnership, allowing the articulation of African opinion in newly formed political organisations (see Lessing 1957). Whereas these organisations had been suffering from an urban bias throughout the 1940s and early 1950s, the discontent caused by compulsory destocking, contour ridging and land re-allocation, allowed African Nationalism to spread throughout rural areas. Yet in Nyanyadzi and other irrigation schemes the implementation of the NLHA had been halted and the opening of the Liebig's factory had brought tangible material wealth to the plot holders in the schemes. Why was it then that Nyanyadzi, and other irrigation schemes like Nyamaropa (Reynolds 1969), became the scene of the most violent outbreaks of protest and sabotage?

In Nyanyadzi, the LDO's residence (top house) and the government storeroom were burnt in 1962. Government staff and entrepreneurial burley tobacco growers were intimidated and harassed, and in June 1964 the first six trained guerrilla fighters, naming themselves the Crocodile gang, were deployed in the area.¹² Together with Nyanyadzi youngsters they tried to petrol bomb the local police station on 30 June and put up a road block at Chikwize bridge the next day. Attempts were made to blow up all major bridges in the district, telephone lines were cut, and finally on 4 July 1964 in neighbouring Biriwiri, Ndangana and his crocodile gang killed Johannes Oberholzer, the first white settler to fall victim to African freedom fighters since the Shona and Ndebele rebellions of 1896-7.¹³

¹² Initially, Ndangana and his gang had been directed to Zwimba, Mugabe's home area. However, Ndangana preferred to go to his native Melsekwa district on account of its mountains, which could provide easy cover.

¹³ Oberholzer was a poor Afrikaner farmer who had gone bust and had been given a job at a sawmill in Silverstream up in the Melsekwa Highlands. For a first hand description and reconstruction of his death see Peter Godwin's imaginative autobiography *Mukiwa* (1996). Ndangana, the leader of the Crocodile gang, managed to escape the Rhodesian security forces and lived to fight another day. He was included in the first batch of ZANLA fighters that was sent for training to Mao's China, and became a ZANLA commander during the war. After the war he was appointed Deputy Minister of Para-Military Affairs, a function he fulfilled until his death in 1984 in a car accident. It is rumoured he was killed by a *puma* (armoured vehicle) that was intended to hit Edgar Tekere.

Two contrasting explanations

According to Plowes, the top provincial Agricola at the time, the nationalist outbreaks of opposition were founded on 'ignorance' and orchestrated by ambitious rural teachers and opportunistic urban politicians. His staff became the object of discontent, because

*'we were the most visible agents of government on the spot. And therefore we were the people that the politicians were best able to use as a whipping horse for promoting their own images. There was a lot of ignorance amongst teachers about what we were doing and why. This is why I then started running courses for the teachers (...) explaining them about the population explosion and poor land use practices'*¹⁴

The reason why irrigation schemes became 'political hotbeds', was twofold according to Plowes. Firstly, the nature of irrigation is such that it requires discipline, and the enforcement of such discipline was the exclusive domain of outsiders to African society.¹⁴ This application of strict supervision had not (yet) resulted in evictions of mal-performing plot holders, but it did provide a source of insecurity (Roder 1965, 174-5). The threat of removal provided an easy rally point for African politicians, who denounced the management as 'oppressors, and racist colonialists', and promised the plot holders free irrigation, unlimited acreages, and crops of their own choice after the overthrow of the government. A second source of inspiration for the African nationalist cause was formed by the secretaries of the co-operatives, who, according to Plowes:

'regarded themselves as being trained in coop matters. They often put money in their pockets and there was just one problem after another with these chaps. They had little committees, but these would be uneducated irrigators and the secretary could just run rings round those chaps. Then.. of course politics started coming in (...) Politicians, somehow they always seem to gravitate where there are aggregations of people, where there is money being made. You don't find politicians out in the sticks. What're you gonna do out there?'

Ndabaningi Sithole (1970), a leading African nationalist, has a different story to tell about the origins of nationalism in Nyanyadzi. He does so in a novel, titled *Obed Mutezo. The Mudzimu Christian Nationalist*, which he wrote whilst in captivity in a Salisbury prison, a fate he shared with the main character in his novel, Obed Mutezo. Ndabaningi himself had finished schooling at Dadaya Mission, which at the time was headed by Garfield Todd, later Prime Minister of Southern Rhodesia. After a short stint of teaching at Mt Selinda mission (1953-55), Ndabaningi was sent to the USA to train as a Methodist preacher. His three and a half years in the USA provided him with a unique experience: 'It was the first time that I felt white people treated me like a real human being' (Sithole 1968, 26). Upon his return to Rhodesia in 1959, Ndabaningi was appointed principal of Chikore Mission primary school. In the same year he published a book titled *African Nationalism*, which was to inspire many future nationalists and propelled Ndabaningi into a leading role in the successive African Nationalist parties.

Obed Mutezo was a Nyanyadzi plot holder *cum* builder. His grandfather was a conscripted Ndaubinduna in Ngungunyana's army. Obed's father was a policeman in the Native Affairs Department before his land and cattle were confiscated and included in a European cattle ranch (Devuli ranch). Obed himself became a practising Methodist Christian in Nyanyadzi. From 1950-63 he was the chairman of the *vabvuwi* (fishermen) movement, recruiting young people for the church. According to Sithole, 'from this movement he (Obed) learnt practical

¹⁴ In Plowes' view it is 'almost impossible for an African to take disciplinary measures when he is living amongst other Africans. You know he can't do it, because pressures upon him, upon his family, his kids, things like that, he just can't do it. We could. Even when we were living there, because we were not part of that actual society. And this is why we could maintain the discipline.'

organisation of public programmes, chairing meetings, handling men, sensing conflicting motives among people', an experience which came in handy during Obed's time as committee member of successive nationalist parties in Nyanyadzi. In Sithole's view, Methodist Christianity was a major source of inspiration for African nationalism, since it was the church that

'first introduced literacy which was to give birth to the African Nationalists, medical doctors, advocates, businessmen, journalists and graduates. (...) The political set-up [in Southern Rhodesia, AB] treated the African as if he counted for nothing, but the church, despite of its many shortcomings, treated the African as something.' (Sithole 1970, 98-9)

Obed Mutezo's motivation to join the African nationalist cause reflected a desire to regain both the lost lands of his father and the ancestral pride of his grandfather, whilst claiming his rightful place in Rhodesian society as a Methodist fellow citizen, earning a decent income. According to Sithole:

'Obed Mutezo's politics do not spring from the study of any textbooks. They spring from down-to-earth situations. (...) Talk to him about Communism, that he does not know. Tell him about American capitalism, he is not concerned. His concern is land, cattle, wages, schools, better housing, better water supply and more medical facilities.' (Sithole 1970, 117-8)

Sithole and Plowes provide two contrasting explanations. Whilst Plowes plays down the legitimacy of African grievances and tries to explain them away in a technocratic fashion, typical of Rhodesian Agricolos, Sithole places African nationalism in the context of the rising tide of independence that swept the continent, imbuing the nationalist cause with Christian Methodist liberation theology and cultural (*Ndau*) pride and resilience inspired by the Gaza state. But who was behind the nationalist cause in Nyanyadzi and why did people join the successive nationalist organisations?

Local interpretations

To find out, I took Sithole's novel in hand and discussed it with some of the real life plot holders that featured in the novel.^{xxxv} One of them was Amos Rwizi, who had been in his early thirties when things started heating up in Nyanyadzi. Amos had been born in Nyanyadzi. His father had been one of the first plot holders in the ill-fated MuNyanyadzi furrow. In 1943, his father resettled in block B and sent his son to Chikore mission school. Amos finished standard 6 and started teaching, first at Nyanyadzi, later at various other schools in the district.

According to Amos, Benjamin Burombo, the veteran nationalist, was the first to visit Nyanyadzi in 1957 to introduce the Southern Rhodesian African National Congress (SRANC).¹⁵ During a well attended rally in 1958 at Nyanyadzi, the SRANC leadership lamented destocking under the NLHA, low wages for Africans, and high bus fares and rents. Amos Rwizi attended the meeting and felt 'awakened' when he was told that Rhodesia should be named Zimbabwe, and that the country belonged to them and not Rhodes. One of the SRANC leaders, Peter Mutandwa, quoted several verses from the Bible to underline their quest:

'Behold, o my people, I will open your graves and cause you to come up from your graves (...) I will put my Spirit in you, and you shall live, and I will place you in your land...' [Ezekiel 37, 12-14]

¹⁵ Benjamin Burombo was the founder of the British African Voice Association and had been one of the ringleaders of the general workers strike of 1948 in Bulawayo. His visit to Nyanyadzi was part of a tour across the country to preach the gospel of a united African opposition under the banner of the SRANC (Bhebe 1989, 116).

'They hate the one who rebukes in the gate, and they abhor the one who speaks uprightly. Therefore, because you tread down the poor and take grain taxes from him, though you have built houses of hewn stone, yet you shall not dwell in them...' [Amos 5, 10-11]

Destocking had not been enforced in Nyanyadzi, but according to Rwizi, the plot holders had been told by the *mudzviti* (District Commissioner) that they were going to remain with only two oxen and one cow each.

'Yet in the European areas we found lots of mombé (cattle). They said if you keep a lot of cattle you cause soil erosion. Yet the hoofs of cattle in the Reserve and in the European areas were the same!'

Amos owned some 18 heads of cattle, which he had to dip every two weeks against payment of dip fees that kept rising. According to Rishon Gwinya, a more senior Nyanyadzi plot holder, ex-teacher, and preacher at the Methodist Sunday school, the time of the SRANC was not about destocking or denouncing the irrigation scheme, but about aspirations for full partnership with the Europeans. The nationalist followers aspired access to higher education than the standard 3 that could be attained at Nyanyadzi school, and wanted better wages for professionally employed Africans. After the SRANC meeting people took out membership cards and the Nyanyadzi committee was formed, consisting of (former) teachers and local businessmen. All committee members had enjoyed Methodist education at Mount Selinda, Chikore or Mutambara mission, and had been or were still professionally employed. Soon they opened another branch in Mutambara. Gwinya estimated that their following in Nyanyadzi comprised three quarters of all plot holders.¹⁶

On 26 February 1959 the SRANC was banned and some 1200 activists were arrested and detained, including six members of the Nyanyadzi committee. Sithole (1970, 122) reports some 600 people of various denominations met at Nyanyadzi church to pray for those held in custody. Amos Rwizi, the organising secretary, was amongst the detained and recalled how they were kept in Kindahi Prison in Salisbury, near the airport:

'It was a big open jail, so we could meet. Dr Banda from Nyasaland was also in the prison. He was our lecturer. We had no time to sleep, there were so many meetings. (...) After three months we were released. The hall was filled with Chiefs who told us to stop doing politics. But we told them we would go ahead. We left the prison fully equipped.'

Upon their return in Nyanyadzi, the six men went ahead under the banner of the newly formed National Democratic Party led by Michael Mawema, maintaining their portfolios. They spread their activities across the whole of Melssetter district and were instrumental in rallying Africans to vote against the 1961 Constitution, since it did not honour the principle of 'one man, one vote'. Amos Rwizi recalled how they encouraged people to 'work against anything to do with the *mudzviti* (DC): against contour ridges, dog tax, and dip fees'. In his opinion there was nothing wrong with contour ridges as such, 'but we got them assigned based on our colour.' In December 1961 the NDP was banned.

Again the Nyanyadzi nationalists continued their work unperturbed, this time under the flag of the newly formed ZAPU, headed by Joshua Nkomo. Protests turned more violent, remembered Amos:

'We left Nyanyadzi to go on strike in Salisbury. We hired a truck and filled it with stones to hit European cars. We thought there were no stones in Salisbury, ha, ha (...) It was not a nice

¹⁶ The remaining quarter did not believe Africans could ever be like a European. Gwinya added that relatively few Methodist followers in Nyanyadzi joined the nationalist cause: 'Those only joined at the time of the United ANC party headed by the Methodist bishop Muzorewa, in 1972.'

experience. We were addressed by our leaders in Rufaro Stadium. Then the whites sent in riot police. Tear gas was fired at us, whilst people used our stones to throw.'

In September 1962, top house and the government storeroom in Nyanyadzi were burnt by local ZAPU youths. According to Amos the LDO was tipped off, since they had nothing against him personally: 'We just wanted to destroy government property to make a point that we were serious.' ZAPU was banned and three Nyanyadzi committee members were arrested and charged for engaging in subversive activities. The Nyanyadzi community raised £180 for their bail (Sithole 1970, 123).

ZAPU was succeeded by ZANU in 1963, with Ndabaningi Sithole as its president and Robert Mugabe as its secretary general. When ZANU held a national congress in Gwelo, in May 1964, all hope of achieving majority rule in Rhodesia by constitutional means had been abandoned. The Federation of Rhodesia had fallen apart, paving the way for the independence of Malawi and Zambia. However, Ian Smith threatened to perpetuate white minority rule in Rhodesia by declaring unilateral independence (UDI). During the congress Sithole announced a five-point plan of confrontation to be enacted the moment UDI was imminent. The plan was designed to preclude UDI by the creation of internal instability and international publicity, through acts of sabotage. Bridges were to be blown up, roadblocks erected, electricity and telephone lines cut, livestock and crops on European farms destroyed, and taxes and schools were to be boycotted (Patsanza 1988, 119; Ranger 1997, 275, 282). Amos Rwizi was excited by the prospect of impending action, which started the day the Crocodile gang arrived in Nyanyadzi:

'The motto we learnt at the Congress was "Die alone". (...) On 19 June 1964 we received the clarion call to war from Ndabaningi. So I started to buy dynamite, making everything ready. (...) There was a helicopter at Nyanyadzi Police Camp. We wanted to petrol bomb it. Unfortunately there was a policeman on patrol, who lighted us with his torch. So we ran away. At Chikwize bridge we put up a roadblock consisting of a heap of stones. We cut the telephone lines. However, some boys were discovered whilst drilling holes at Madzororo bridge (near Mutambara) to place dynamite sticks. They ran away, but were caught. They told the Police what we were up to. That is when the house searches started.'

On the first and second of July 1964 hundreds of ZANU activists were rounded up across the country. In Nyanyadzi some 20 activists were detained and tortured at the police station. Amos Rwizi intended to keep his mouth shut and wanted to 'die alone as we had agreed in Gweru. But Mutezo said: "No, I've already told everything." So I showed the Police the remaining sticks of dynamite.'

After being subjected to elaborate torture sessions in the former lime stone quarry behind the police station, known as the *chechi* (church: a place for confession), the Nyanyadzi detainees were charged for subversive activities and complicity in murder in Umtali court. Ten activists were served with death sentences, but these were dismissed by the court that found their statements inadmissible on account of the interrogators extensive use of beatings and torture. Eight Nyanyadzi men were subsequently kept in detention at Hwa Hwa, and later Sikombela, restriction camps. They were released only in October 1965, just before UDI was declared.¹⁷ With the police watching every step of the released nationalists and the national leaders kept in detention, organised resistance in Nyanyadzi against the government ceased.

¹⁷ The arrested members of the Crocodile gang were not so lucky. Their death sentence had been reprieved by the Queen, but they were nevertheless executed on 6 March 1968 'as a deliberate act of defiance by the Rhodesian Government' (Ranger 1997, 282).

Conclusion

In conclusion, one can observe that nationalist opposition started modest, and received support in Nyanyadzi from a tiny community of businessmen and craftsmen, who felt constrained in their activities by a conservative and reluctant Administration, and teachers who aspired full partnership and demanded a square deal for Africans in developing the country. The NLHA did not result in a large scale confrontation over destocking or land rights in irrigation schemes, but combined with the strict management did create insecurity and disaffection which was to inspire local resistance against the government. The tone was moderate to start with, but given time and lacking substantial concessions by the government, African nationalist demands turned more radical and their means of operating more confrontational. Whilst the senior plot holders included in the local branch leadership favoured dialogue, their Mission educated sons were at the forefront of more violent actions. These 'angry young men' of Nyanyadzi knew each other from mission school, where they had been responsible for various forms of 'mischief'.¹⁸ They were not by any means devout Methodist Christians, as the reverend Sithole would like us to believe, though they strongly identified with a Christian meritocracy, and had all experienced the disadvantages of being an African in their professional employs across the country.

As indicated by Plowes, the Agricolos running the scheme were quite surprised by the amount and kind of resistance they met. The dominant viewpoint on the matter was that however painful the enforcement of discipline among irrigators might be, its application remained the critical ingredient for successful irrigation. The LDO's interviewed by Roder in 1962 indicated more rather than less compulsion was required. So instead of revising the management style, more of the same was needed. The feeling of insecurity of tenure was ascribed to uneducated plot holders, who had difficulties understanding the rule of law, fearing their removal from the plot 'any time at the whim of the Native Commissioner' (Roder 1965, 173-5). The Administrators had their own view on the problem of African nationalism. The DC for Melssetter wrote in 1971 that the lack of a proper system of land allocation (with tribal leader approval) in the past, had

'produced a lack of tribal cohesion in and around the settlement; and to-day we have plot holders who originated in many different districts and who have few feelings of allegiance to the area Chief (Muusha). This lack of tribal discipline and cohesion has been responsible for lax discipline in other fields and it is at Nyanyadzi that we have found more dissident, frothy-mouthed nationalistic politicians than in most other parts of Rural Rhodesia.'^{xxxvi}

The solution, in his view, lay in the gradual enforcement of even stricter regulations and the 'building up of a Tribal Authority (Chief, headman and kraal-heads' committees) as a consultative body'. With that, plans for a gradual withdrawal and on-going specialisation were thrown out of the window.

5.3 THE BELEAGUERED ADMINISTRATOR'S SCHEME (1967-1980)

With the rise of the Rhodesian Front to power and declaration of Unilateral Independence in November 1965, the government reverted to strict segregationist development policies. Each

¹⁸ For instance Barwayi Gwitira (son of a Nyanyadzi plot holder, ZANU member and building instructor at Mutambara mission in 1964) had been evicted from Mt Selinda mission school for leading a student revolt against unpaid school chores during holidays. Joseph Mughido (son of a Nyanyadzi plot holder, and ZANU branch secretary in 1964) was evicted from Mutambara mission school, because of 'mischievous behaviour'. Amos Rwizi had to resign from his teaching post at Mutambara, after a school inspector had caught him smoking. Amos protested that he had discovered the inspector himself, smoking at a toilet. Amos' rebuke: "So you want to smoke alone?", cost him his job.

race was to be developed in its own area. Alvord's community development ideals were revived in firm traditionalist clothes. The Tribal Trust Lands (formerly known as Reserves) were to be developed under the guidance of (reinvented) Tribal Land Authorities (i.e. chiefs, headmen and kraalheads). As argued in chapter 2, the new policies did not differ much in technical content or intervention rationale from the previous era. Only the vehicle to achieve development and regeneration of the TTLs switched from Alvord's modern men to the Administrators' traditional leadership. Irrigation was to play an important role in the development of rural industries in so-called growth points, designed to stem the flow of African labour migrants to town (Weinrich 1975, 40). A para-statal company, the Tribal Trust Land Corporation (TILCOR) was set up in 1968 to establish these agro-industrial industries, using private and public capital for the development and exploitation of natural resources in the TTLs. The TILCOR enterprises consisted of a large 'core estate' providing services (inputs, mechanised ploughing, marketing facilities) to African tenant settlers (Rukuni and Makadho 1994, 130). Over time six growth points were developed, of which five were irrigated. Chisumbanje formed the largest of these irrigation factories, where tenants were issued temporary (six months) leases to produce wheat and cotton on 2 hectare plots (Hughes 1974, 252). In existing African smallholder schemes the Ministry of Internal Affairs topped the Agrícolas and set out to craft irrigation factories, maximising on the number of settlers per acre, increasing the agricultural output, and creating rural industries to absorb excess labour.

Exactly what these new Rhodesian Front policies meant for a place like Nyanyadzi can be gleaned from a 1971 memo of the DC Melsetter. After observing that besides the 420 plot holders, some 10,000 'tribesmen – about two thirds of them youths and children' resided in Nyanyadzi, the DC continued as follows:

'This means that each plot-holder has some 40 (sic) dependants to care for because most of the non plot-holders scratch for a living in the surrounding dry land, fail in their endeavours and automatically claim extended family relationship with all the obligations of support this involves. One of the socio-political problems is, of course, to get these useless hangers-on earning a proper livelihood. Junior Secondary Schools, Young Farmers and Womens Clubs cottage industries and, possibly, some rural factories processing locally grown agricultural products, are some of the developments which will have to be encouraged. Indeed, we believe that a kind of peri-urban infra-structure could quite easily be built up. Professionally trained Africans – Doctors, Dentists, Lawyers, Accountants, etc.- might be encouraged to go into business and settle. Home town planning has been done but a great deal more is needed. Purified water has been laid on some premises – (...) – and the generating of hydro-electric power in limited quantities could be done immediately if there was a sufficiency of water (a turbine is already installed). One avenue and service road for the business centre have been tarred. An hotel has been established and, given the idea, other places of recreation/pleasure could create a thriving centre for the vacation minded urban African dweller. The two requisites to orderly development remain: (1) Additional water supplies to ensure desirable turn round; (2) Maintenance of discipline. xxxvii

Presented below are firstly the ways in which the Administrators and Agrícolas joined hands to tackle the latter two requirements, in the process transforming Nyanyadzi into a highly productive, irrigation factory during the early 1970s. Lastly it is briefly discussed how the war of independence affected the scheme's management and ultimately resulted in the closure of the scheme in 1978/79.

Refining the technologies of control: turning Nyanyadzi into an irrigation factory

On the first of July 1967 the aptly titled Ministry of Internal Affairs announced a new order, internalising the affairs of African irrigators. The move vested control over their 'proper'

functioning in the DC, whilst all day-to-day control over the schemes was centralised in the hands of a resident Irrigation Manager (IM). In a circular dated 31 August, the secretary for internal affairs outlined the future modalities of managing African irrigation schemes. Standard land allocations were to be reduced to two acres per plot holder, ploughing of land was to be done by tractor with the costs borne by the plot holder, and each plot holder had to enter into a so-called lease agreement. If the plot holder did not sign the lease within six months, 'he shall be required to leave the scheme.' New, increased water rates were announced, failure of payment would result in eviction.^{xxxviii} Thus the new order was set. The question now was whether the water-network and its users could be crafted in its image.

Table 5.3: Increased refinement of technologies of control at the disposal of the Irrigation Manager

Year	Technology	Purpose
1958	Kraalhead committee	Remote control over plot holders, centralising point of interaction
1959	Cooperative society	Control over disposal of crops (1967: crop tax); provision of inputs and chemicals; indirect control over crop choice via crop contracts.
1967-8	Lease permit	Eviction of non-complying plot holders
1970-1	Control of Irrigable Areas	Legal jurisdiction over land vested in the IM
1972	Siphon irrigation	Control over irrigation watering, by monopolising syphons
1972	Plot no. inscribed in canal	Monitor individual performance; monitor staff's effectiveness
1972-6	Grading/points system	Monitor individual performance, evict low performers
1974-9	IM patrols with gun	Confirm authority, secure personal safety IM
1975-8	Protected village	Control movements of plot holders, prevent guerrilla incursions

From 1967 to 1975, resident irrigation managers and DCs gradually introduced stricter regulations, turning the schemes into commercial irrigated estates with a closely regulated labour force of African tenants (Hughes 1974). Table 5.3 provides an overview of the technologies of control at the disposal of the successive Irrigation Managers in Nyanyadzi.

The new leases would make each plot holder eligible for eviction, if he/she did not comply with any one order of the IM, i.e. if incorrect amounts of fertiliser had been applied, if planting dates were violated, if water was taken out of turn, etc. Yet the Nyanyadzi plot holders actively contested the new order. When they were asked to sign the leases before the 31st of August 1968, all refused. In response, the management decided to close the canal. Some of the plot holders mobilised solicitors in Salisbury, who duly informed the Provincial Commissioner (PC) that the cutting off of water supplies to Nyanyadzi, Mutema and Mutambara schemes was tantamount to eviction, since these schemes had not yet been gazetted as irrigable areas, under the Control of Irrigation Schemes Regulations of 1967.^{xxxix} In September 1968 Robert Nkomo was asked by the IM to sign the newly drafted leases in his capacity as chairman of the Nyanyadzi cooperative. Nkomo refused:

The people did not want it. The rumour was that if we signed the whole irrigation scheme would be given to TILCOR. Then the irrigation manager asked me to call the kraalheads. I refused again, so he called the kraalheads into the office himself. They also refused to sign. Then the irrigation manager came to me, offering me bags of money, if I signed. I refused again.^x

By the end of October 1968 the water supply was resumed, but resistance had spread to all irrigation schemes in Melsetter district. A brother of one Nyanyadzi kraalhead told a District Assistant that 'he would rather be evicted than take out a lease.' Those plot holders who had already paid their water rates were harassed by others who had refused to do so. The DC

observed that 'No leases at all have been signed and the main reason heard by the patrol against leases is that far too much power is placed in the hands of the Irrigation Manager.'^{xli}

The ensuing standoff resulted in gritted resilience amongst the Administrators. New regulations were drafted under the Tribal Trust Land Act (control of irrigable areas), confirming the paramount role of the IM in areas declared irrigable^{xlii}, whilst allowing the PC to cut water supplies 'if a breakdown of discipline or widespread resistance to the authority of the DC occurred'.^{xliii} With the construction of a dam on the Nyanyadzi river imminent (see below), the PC sought to address the 'main defect of the Nyanyadzi scheme: the idleness and lack of discipline of the irrigators.' He proposed the enforcement of ploughing and ripping by tractor at the plot holders' expense; application of fertiliser and spraying of crops to be done by the extension staff paid by the plot holder; and payment of water rates in advance. The PC was convinced such action would result in more efficient production and better yields:

'It is hoped that the application of these rules will result in many of the present irrigators leaving the scheme. This is all to the good, as the habit of idleness and non-co-operation is so deeply engrained that we are much better off without them. There should be no difficulty in finding replacements.'^{xliv}

The secretary for Internal Affairs concurred on the proposed line of action, stressing that all holdings should be reduced to two acres. If the move precipitated a massive abandonment of the scheme by the plot holders, 'the effect would be to lighten your task.'^{xlv}

In June 1971 the PC instructed his DC to evict those plot holders who did not pay their water rates in time. In order to break continued resistance against the lease permits, the PC favoured a strategy of divide and rule: on the date of payment, those who had paid could instantly take over the plots of those who failed to pay.^{xlvi} DC Melsetter preferred a more cautious approach, stating that the Tribal Authority (kraalhead committee), like the previous year, had requested for delay in collection of water rates, since not all their cash crops had been paid for yet. Considering the inadequate water supply to the scheme, there was good reason to deal sympathetically with this request.^{xlvii} However, the PC would not have it. He checked with the senior agricultural officer, whether the plot holders had been paid for their crops. The officer found out from the Cooperative Officer that most of it had been paid, and the DC was duly instructed to enforce water payments before the 31st of July.^{xlviii} The net result was the eviction of some Nyanyadzi plot holders, to be followed the next year by another wave of evictions.¹⁹

At the same time, Nyanyadzi's canal network was once more upgraded. Canals were broadened and lined at a higher elevation to facilitate the introduction of syphon irrigation (see Photo 7). The syphons were presumed to increase water application efficiencies. Since the syphons were kept in a central shed and issued to individual plot holders on the day of their water turn, their use also facilitated further managerial control over the application of irrigation water. Yet, the removal of fruit trees lining the previously earthen furrows, caused much resentment amongst the plot holders. In January 1972, a letter of complaint was sent by 'hungry people at Nyanyadzi'. The writers deplored the destruction of fruit trees without the payment of compensation, reduction of their plot acreages due to road construction inside the scheme and the compulsory procurement of seeds and fertiliser of 'bad' quality. Other complaints concerned the manager himself:

¹⁹ I could not establish how many plot holders were evicted, since the IM Nyanyadzi refused access to these 'sensitive' files in 1997. The nature of this sensitivity is explained in chapter 8.3.

'He says every time that "Africans always give more trouble". We used to have general meetings whereby people would get views from other farmers, but he does not like to hear it. (...) We have many complaints to write: Can we have a better one. Next time we don't write a letter. Do away with him.'^{xlix}

The tone of the letter reflects the resurgence of African Nationalism in Nyanyadzi. 1972 was the year of the constitutional referendum administered by Lord Pearce. Bishop Muzorewa rallied for an African 'No' vote through his United African National Council (Todd, 1972). The war of liberation started in earnest with ZANLA guerrillas penetrating the North-East of Rhodesia. Unperturbed the Administrators continued their quest for a new order in Nyanyadzi, though with a new IM and new DC. Water rates were raised to \$14 per acre, with another rise to \$28 announced for the next year, to be paid in two terms in advance of the summer and winter season respectively.²⁰

Whilst the Nyanyadzi kraalheads tried to prevent close identification with the management,²¹ the IM and DC ensured every decision was supported by the kraalhead committee. The kraalheads were perceived, by the officials, to form the only legitimate authority to the average African. For instance in March 1968, when the management had decided to deal with an impending water scarcity by limiting the acreage to those parts of blocks A and B which could be serviced by the Odzi pumps, the kraalheads were informed and their co-operation was sought.¹ The kraalheads duly agreed and were subsequently asked to supply the IM with names of people who would undertake winter irrigation.²²

Further attempts to maximise production comprised the painting of plot numbers on canal banks and signposts, so as to allow the IM to monitor the performance of individual plot holders from top house (with help of binoculars).²³ Another means of improving production was the introduction of a system that graded the plot holder's performance, designed to serve as a 'Sword of Damocles'. Whilst government legislators relegated imposition of such measures unpractical, the IM for Nyanyadzi worked out a points system whereby plot holders 'were rated on their level of production, on preparation of the land, whether they were late in planting, whether they were absent when the water bailiff came to give them their water, etc.'²⁴ If the plot holder fell below a certain level, he could be evicted 'to make way for a better and bigger producer'.ⁱⁱ In 1975 there were four grades: the top two grades were safe, the bottom two had to improve or risk eviction.ⁱⁱⁱ

²⁰ After 1974 the water rates were scaled according to the irrigation interval. Those with irrigation intervals of less than 10 days paid \$28 per acre; those with intervals of 10-14 days, \$14; and the remainder \$2.5 per acre. The national currency changed from pounds to Rhodesian dollars (1 £ = 2 \$).

²¹ Some kraalheads shied away from management meetings; others appointed African nationalists as their secretaries, and all openly resisted the imposition of leases. In Mutambara the Chief was in the forefront of resistance against the government, leading to the forced closure of Mutambara irrigation scheme in 1974 (Alexander 1993, Manzungu 1995).

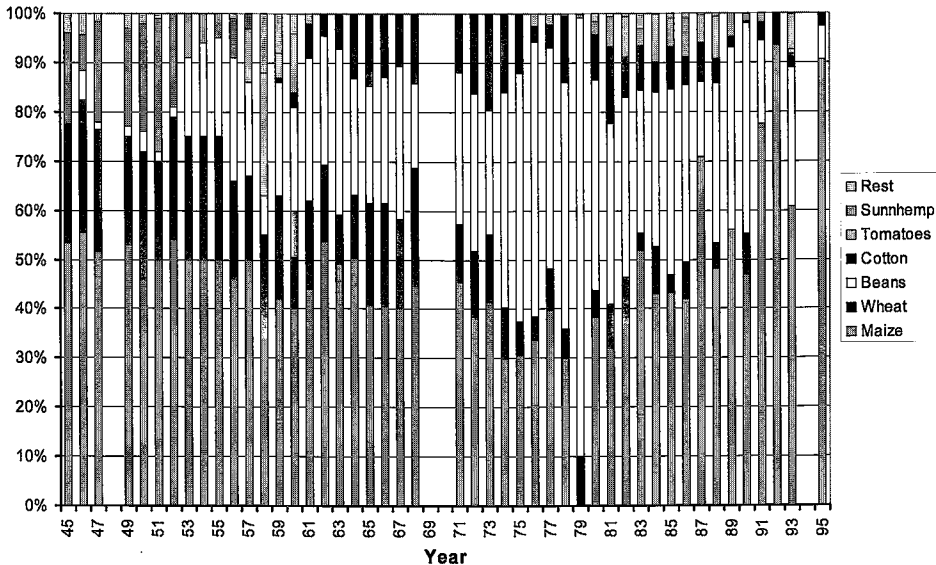
²² The measure also involved the use of block A and B plots by plot holders from other blocks. The DC made it clear to the kraalheads that registered plot holders would be held responsible for the activities on their plots and payment of water rates. Thus the kraalheads were left with the nitty-gritties of administration on behalf of the management, whilst the very act of temporary land re-allocation was only feasible because the kraalheads had no authority over the land.

²³ Such methods of surveillance mirror the panopticum described by Foucault (1977). If the IM found the state of one plot wanting, he sent one of his African extension agents to summon the plot holder to his office. Interview with AEW Mutede, Biriwiri, 17 September 1996; and AEW Tembani, Shinja, 10 June 1997.

²⁴ The stipulated yield levels were 4.5 ton/ha for maize; 2.1 ton/ha for cotton; 1.1 ton/ha for beans; 1.9 ton/ha for wheat.

Around the same time a protected village was established in Nyanyadzi, confining people's movements to the area west of the (new) electricity line. Designed to win the hearts and minds of the Africans for the Smith regime, protected villages were meant to offer 'protection' against guerrilla incursions, whilst simultaneously cutting off rural support (food) for the insurgents. The policy facilitated further administrative control over Nyanyadzi inhabitants, but failed to win their hearts and minds. Rather the 'keeps', as they were known among the populace, fuelled existing disaffection with the government (see also Weinrich 1977).ⁱⁱⁱ From 1976 onwards the management slowly retreated into a fortress, with the manager retiring to his guarded office at top house.^{liv}

Graph 5.3: Nyanyadzi annual crop acreages, 1945-95



The net result of the increasingly sophisticated forms of managerial control was that Nyanyadzi scheme started to look more and more like an irrigation factory. The water-network and its regimented army of plot holders became highly productive, as is indicated in graph 5.2. Maize yields shot up to 7 or 8 tons/ha during good rainfall years.²⁵ The share of commercial crops in the total production output also increased. Graph 5.3 shows that during 1974-79 the share of subsistence crops (maize and wheat) dropped to below 50% of the total acreage for the first time in the history of the scheme.

Community development at a regional scale: securing the missing elements

Water scarcities continued to haunt Nyanyadzi, despite a new network of automatic flow recorders on the Nyanyadzi and Odzi rivers that allowed the management to better predict looming scarcities and limit the dry season acreage. In response to the scarcities of 1968 and

²⁵ These figures have to be treated with some caution, since they were based on estimates and interviews with plot holders, who were likely, under the prevalent grading system, to portray a favourable image of their performance. The new IM, who took over in April 1977, cast doubts on the reported yields, since they were 'far too high'. He instructed his staff to estimate yields themselves, without relying on information of plot holders, 'who will claim anything from 50 to 100 bags per acre. Truly world champion maize growers, and strangely enough some only need a bag of fertiliser to do it.' CONEX files, *Annual report Nyanyadzi irrigation scheme for the year 1976/77*, 4 November 1977.

1973 the acreage for beans was cut to a quarter of the normal acreage. To alleviate the scarcity problem the DC and scheme management resorted to beaten tracks: canal lining and refurbishing the pumps. For instance in February 1968, the DC Melsetter observed that the Nyanyadzi canal network was still largely unlined incurring water losses of 20 to 40%. Under the new dispensation Internal Affairs was responsible only for the internal canal network spanning some 57 km, of which only 2.7 km was lined. The new Department of Water Development (DWD, successor to the ID) was responsible for the 16.5 km of canal leading water to the field edge (33% lined canals). The DC proposed to line some 1.8 km of internal furrows per year and requested money for cement, moulds and wages. Fired on by a looming water scarcity, the DC sent a follow up minute in March 1968, claiming the imminent closure of the main canal provided an excellent opportunity to line it. He also urgently requested for a dam on the Nyanyadzi river.

The dam

As usual, there were no or only limited funds available for these plans. But this time the three main actors (DWD engineers, CONEX Agrícolas, and the DC and PC of Internal Affairs) crafted a coalition of interest aimed at getting the Nyanyadzi dam in place. Thus an iterative process started, where the large potential dam storage legitimised an expansion of irrigated area, whilst the huge costs involved in constructing the dam, necessitated further increases in agricultural productivity and cost recovery (e.g. hiked water rates). The dam project served a variety of interests all supposedly for the benefit of the African population and the ailing Nyanyadzi water-network: the Engineers could expand their manpower and status by means of a large project; the Agrícolas could maximise agricultural output, and the Administrators, who topped the previous two in status and authority, could resettle more Africans in irrigation schemes, absorb excess labour in local agro-industrial industries, and enforce strict supervision to stem Nationalist opposition. From the start the project was split in two: the dam on the one hand and the improvement and expansion of the existing scheme on the other. Tasks were split amongst the Engineers (dam and expansion survey); Agrícolas (agro-economic appraisal) and Administrators (overall coordination and socio-political appraisal). Local resistance on the ground against the new control regulations as well as the stringent economics of a nation battling with international sanctions and readying itself for war, complicated the process and endowed it with an element of doom from the very start.

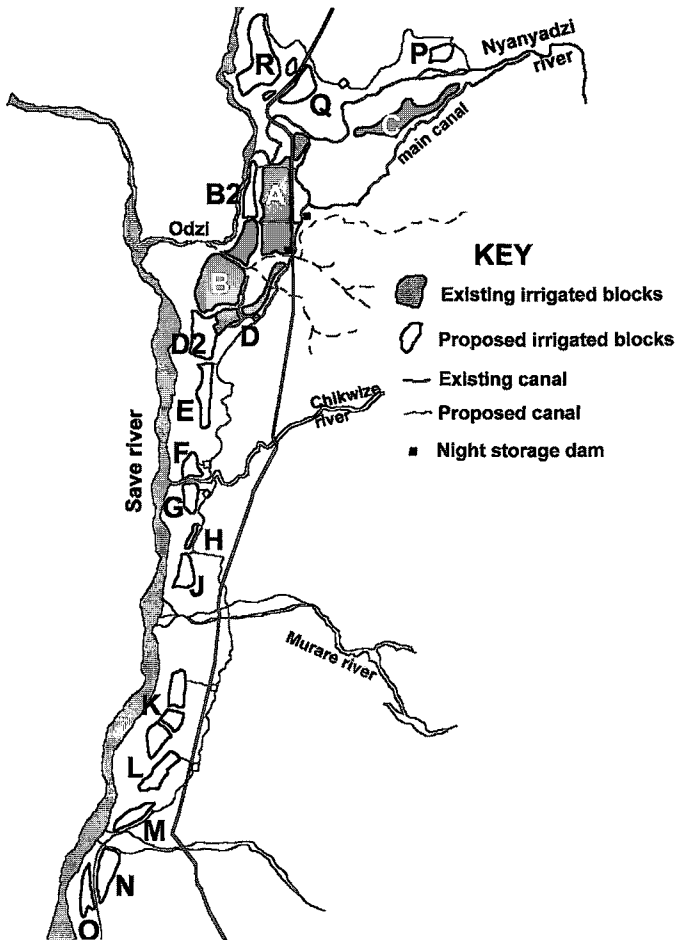
The first survey for expansion of the existing scheme in August 1968 projected the addition of some 450 acres (182 ha) to the existing scheme, whilst allowing the opening up of another 300 acres in a separate scheme north of Nyanyadzi (Nenohwe). First indications of the potential dam yield legitimised inclusion of an extra 400 acres in Gudyanga and further South (see map 5.1). Destruction of survey beacons and stone filling of test drills at the dam site, by suspected nationalist youths, delayed the work. In March 1969 the preliminary project report was published. The DC Melsetter was shocked by the 'tremendously high cost of setting things right at Nyanyadzi', and felt inclined to abandon the whole scheme.²⁶ In particular the DC deemed the projected water rate of £29 per acre too high, however necessary from the viewpoint of cost recovery. In the end the DC declined to abandon the project on three grounds: the local community was deemed incapable of running the scheme itself; abandonment would result in famine relief costs; and the government was morally obliged to cater for the large dependent population which had been put in Nyanyadzi at the instigation of the same government. The DC concluded that:

²⁶ No doubt, the prevalent levels of resistance in Nyanyadzi against the lease permits informed the DC's inclination.

'For the sake of the long-term national economy; for the sake of providing additional food and increased employment opportunities for a rapidly growing population; and, in fact, for the sake of security and political stability, these schemes must be expanded where soil, water and climatic conditions are favourable. The cost to the country for doing positive development at whatever expense must be weighed against the cost to the country if improvements are not brought about.'^{iv}

Thus the DC attempted to legitimise the huge project costs, which in April 1969 amounted to £300,000^{vi}, excluding the dam, estimated to cost an additional £250,000^{vii}. The dam was designed to contain some 4.6Mm³, which would supply 550 l/s to the scheme (almost doubling the Nyanyadzi water right).^{viii}

Map 5.1: Proposed expansion of Nyanyadzi scheme, 1969



Note: The project plan of 1969 included a dam (not shown on the map) some 15 kilometres upstream of the Nyanyadzi intake. The plan projected an expansion comprising blocks B2, D2 and E to O, providing for a total irrigable area of 1,060 ha (of which 446 ha was already in use). In the end only block D2 was partially constructed. After independence some of the other blocks have been constructed, this time with a pumped water facility from the Odzi river instead of an extended gravity canal from the Nyanyadzi river. Nenohwe irrigation scheme (comprising blocks Q and R) was opened in 1996, after an extended construction time of 10 years. Block E was added to the Nyanyadzi network in 1998. Guyanga irrigation scheme (comprising block K) was opened in 1997, Tonhorai irrigation scheme (comprising blocks N and O) one year later (1998).

The plan provided for the irrigation of a total command area of 1,060 hectares, contained in 17 separate blocks, that were ordered like grapes on two vines of gravity canals (see map 5.1). Meanwhile the Provincial Water Engineer (PWE) was puzzled by the intricacies of the existing water-network:

'A large number of the plots are presently irrigated from more than one side at times, showing the extreme flatness of some sections, and some of the earth furrows can carry water in both directions'^{lix}

To increase the likelihood of getting the project funded the CONEX officer in his agro-economical appraisal deliberately inflated yield figures for cotton, beans and wheat. His head office did not appreciate such juggling with figures. The officer was instructed to reduce anticipated yield levels to a mere 25% over those achieved in the previous ten years.^{lx}

Then the project hit a snag. The PWE reported in August 1969 that head office at Internal Affairs was unable 'to justify on sociological grounds the immediate construction of the Nyanyadzi dam', and sought clarification from the PC.^{lxi} The rumour was promptly dispelled by the secretary for Internal Affairs, who claimed that the dam remained top priority.^{lxii} In 1970 further survey work was done and a dam site selected. Surveys were concluded, agro-economic appraisals updated, whilst the reconstruction of the Nyanyadzi canal network was started. Finally in April 1971 a new project report was presented. The chief projects engineer wondered whether the anticipated water rate of \$18 per acre was correct, in view of the recent plot holders' resistance against rate increases.^{lxiii} The CONEX officer promptly revised the water rates and increased them to \$28 per acre, claiming that any 'irrigator who refuses to pay water rates will be evicted'.^{lxiv} But the dam project was already doomed. In September 1971 the PC admitted to the DC Melsetter that the project team was working on a two-track scenario: in case the dam wouldn't materialise, a new pump station with electrified pumps would be constructed. In case the dam did materialise, the plans for the new Odzi pumps would be shelved.^{lxv}

It seems the plans for a dam were scrapped sometime between 1971 and 1973. Whether the dam was too expensive to be borne by the (war and sanctions) embattled Rhodesian economy, or the local socio-political situation in Nyanyadzi (i.e. nationalist resistance) did not warrant further expenditure, is not clear. The water storage right for Nyanyadzi dam lapsed in October 1976.^{lxvi}

Electrified pumps

Thus the management again reverted to a tested solution of Nyanyadzi's water woes: increased pumping capacity. In 1973 an additional pump was placed in the Odzi/Nyanyadzi pump station to cope with frequent breakdowns.^{lxvii} By February 1975 the plans for expansion of Nyanyadzi were revived, this time cloaked in terms of community development at a regional scale. Lacking a dam the priority now was to establish an electricity facility to run a newly sited pump house which could augment water supply for the ailing Nyanyadzi network combined with a watered down version of the expansion planned under the dam project (including Nenohwe and blocks D and E, totalling 618 ha). Since Nyanyadzi was one of the proposed growth points it received a high priority. The Nyanyadzi water right to abstract Odzi river water could easily be increased by transferring the water right of the moribund Maranke project to Nyanyadzi.^{lxviii} The project report of September 1975 promised to reduce the risk of insufficient water supply to about 10%.^{lxix} The project tied in with a regional development plan, which was developed by South African consultants. This plan projected

the establishment of village based growth points at existing and new irrigation projects on the eastern bank of the Save valley.²⁷

The electric pump station and envisioned expansion of the scheme fell victim to war economics. In 1976 additional diesel pumps were placed to cope with continued water scarcities in the Nyanyadzi river.^{lx} The pump station was submerged during storm floods in February 1977^{lxi}, and in general failed to supply sufficient water, due to frequent pump break-downs and scarcity of both diesel and spare parts. Thus it proved difficult in most years to maintain an irrigation interval of 18 days, let alone to supply the required peak irrigation interval of 9 days.

Community development on the eve of war

The Save development plan also projected the establishment of a variety of businesses and secondary industries to employ the multitudes of unemployed youth that haunted irrigation settlements. Such plans had initially been deferred to TILCOR, who were approached in 1969 to identify business opportunities in order to create 'an overwhelming desire in the farmer to purchase goods amply displayed before his eyes in a tempting manner at hitherto undreamed of low prices.' In 1972 the DC Melssetter phrased a similar desire, expressing the need for a good supermarket at Nyanyadzi. In his eyes the best way to 'stimulate the African to produce more (...) was to offer more, particularly in the field of luxury goods.'^{lxxii} Lacking outside investment, the supermarket was ultimately opened by the Nyanyadzi co-operative society. By 1975 Nyanyadzi was one of the biggest rural growth points in Rhodesia (Heath 1990), harbouring 50 African businesses, four schools, a clinic, a post office, a police station and the co-operative warehouse and supermarket.

Over time the management increasingly directed its attention at creating employment for the many unemployed school leavers resident in Nyanyadzi. These were perceived by Administrators to form a potential security threat. In 1975 some 391 plot holders occupied 407 ha of irrigated land, engaging only half of an estimated resident population of 5,000. Plans to mechanise the scheme had been aborted since mechanised agriculture would deprive these youths of work.²⁸ The staff establishment at Nyanyadzi in 1975 according to the 'line of command' comprised one IM, one African supervisor, four extension assistants, eight water bailiffs, two community advisors, one youth extension officer, two health assistants, one meteorological officer and one building instructor.^{lxxiii} The youth extension worker focused on establishing so-called Young Farmers Clubs (YFCs) that were supported and trained in all kinds of income generating activities, such as poultry keeping, gardening, horticulture, veterinary care and wood carving. Two female community workers trained young girls in cookery and sewing.^{lxxiv}

In May 1975, the inter-ministerial development committee for Nyanyadzi even discussed the possibility of handing over the running of the scheme to the newly formed African Council. However, this was considered too expensive for the Council, that could not even bear the daily expenses of running the pump station. At the same time the kraalhead committee asked to be exempted from future involvement in such development meetings, signifying the

²⁷ The plan included existing irrigation settlements at Chakohwa, Nyanyadzi, Mutema, Tawona and Chibuwe, and new irrigation settlements at Musikavanhu, Nenohwe, Gudyanga, and Tonhorai. The plan also projected the construction of a railway line from Chiredzi to Umtali. After independence all proposed irrigation settlements were constructed (see map 5.1), but the railway line did not materialise.

²⁸ Yet, some 400 unemployed youth at Nyanyadzi refused to pick cotton in the European irrigation settlement at Middle Sabi, a fact which was begrudged by the Irrigation Manager.

bankruptcy of the traditionalist community development policy.^{lxv} Yet the Nyanyadzi kraalheads did exploit their nominal authority to issue out land. By 1975, some 405 hectares of the 2331 hectares of grazing land were occupied by 'squatters', placed there with the consent of local kraalheads. The IM tried to evict them, but since no alternative land was available for resettlement, they were allowed to stay.^{lxvi} Thus the plans to turn Nyanyadzi into a proper irrigation factory were only partially successful. The ensuing war of independence made them impossible.

5.4 NYANYADZI AT WAR (1975-1980)

After the Zambia and South Africa imposed détente fell through in 1975, ZANU's leadership fled to freshly independent Mozambique and started training guerrillas to open up a new front in eastern Zimbabwe. Melsetter district, partly because of its proximity to Mozambique and its rugged terrain, became an active war zone witnessing some 1,053 'contacts' between 1976 and 1978, whilst the number of operational European farms dropped from 108 to a mere 8 in the same period (Alexander 1995, 180). The old ZANU party network in Nyanyadzi was revived in 1975. Many businessmen, teachers and wealthy plot holders became involved in recruiting and transporting youngsters from Nyanyadzi and surrounding areas to the Mozambique border to fight with ZANLA. By the end of 1975 some 86 people from Nyanyadzi were rounded up and kept in detention at Hwa Hwa for subversive activities. Once more the core of the Nyanyadzi nationalists was locked up.²⁹

Yet the attempt of the authorities to deal with the 'terrorist menace' by removing the African nationalists from the community and establishing a protected village to contain infiltration by guerrillas, failed. By the end of 1976 the vanguard of the ZANLA guerrilla army had reached Nyanyadzi. The *vakomana* (boys, as the guerrillas were known locally) infiltrated the scheme by crossing the Odzi river at night. They held nightly rallies (*pungwes*) to 'educate the masses' about their cause and to investigate local grievances. The meetings could last throughout the night and were spent singing revolutionary songs and chanting slogans against the Smith regime (*Pasi na Smith! – Down with Smith!*). Those who were suspected of supporting the regime or were found culpable of any other wrongdoing were publicly questioned and beaten up. Initially the *vakomana* did not direct their attention against the irrigation scheme itself, though the blasting of the co-operative supermarket, burning of tractors and shoot-out at top house in 1976, did create great unease amongst the scheme's management. Controls were relaxed and the management started to operate more cautiously. However, with the intensification of the war during 1978-79, the scheme started to resemble a besieged fortress with its management performing a holding operation. Outside the scheme agricultural extension work came to a standstill, as recalled by Plowes, the top ranking Agricola in Manicaland province:

The first thing I did when actual hostilities started stepping up, was to pull all my white staff out of the field. Because for him to go out to any farmer was signing that farmer's death warrant, apart from endangering that officer himself. Let the [African] staff come in and see him at his office. African staff was redeployed in their own home areas, so they would have the support of their own communities. In spite of everything I tried we did lose quite a number. I had roughly 300 African staff. I can't remember exactly but over two dozen of them were killed by guerrillas during the war. A lot of our master farmers were beaten to death.^{lxvii}

²⁹ Rishon Gwinya recalled that whereas in 1965 the detainees could freely walk around, meet and discuss as long as they reported at the evening roll call, in 1975 they were locked up in rooms containing 8-10 persons each. Food was served in the room and nobody was allowed to leave.

Exactly how the Nyanyadzi management coped with the war and how the war affected the operation of the water-network and its users, is the topic of this section.

Playing war with the comrades: government staff during the war

Initially the guerrillas, or comrades as they called themselves, acted upon complaints of the local population and concerns over their own safety. Their first attacks involved the machine gunning of top house during Christmas 1976. Top house at that time was used by district assistants, 'the eyes and ears of the DC', who roamed the community looking for information on the whereabouts of the guerrillas. They were despised by the guerrillas and feared by the community for their brutal ways of extorting information. Many of them were 'hunted for' and killed during the war.^{boxviii} A second object singled out for attack was the cooperative, which was disliked by most of the Nyanyadzi plot holders, since the deductions made on their cash crop pay outs for inputs, spraying material and co-operative union subscription were considered exorbitant.^{boxix} Also the cooperative was clearly identified with the Smith regime: a European Cooperative Officer controlled the bank account.^{boxx} Tembani, an extension assistant at that time, recalled how the comrades wrote a letter to the IM, Mr Reynolds, saying 'don't encourage this coop business'. Reynolds showed the letter to his African staff asking for advice. He was advised that the cooperative had nothing to do with him. He better stay clear of it. After another letter, Tembani was suspected of writing it and taken to the Police Camp for interrogation and comparative handwriting. Sometime later the cooperative supermarket was blasted by the *vakomana* and many goods were destroyed.³⁰

The IM spent most of his time in his office (at top house) and went for field inspections only when armed and in the company of his African staff, but otherwise still operated the scheme as usual. His African staff, however, favoured a more cautious approach, realising that Reynolds' occasional call-ups with the Reserve Police did little to enhance his popularity with the comrades. Tembani recalled that Reynolds wanted to enforce payment of water rates for the winter season of 1977, which was marred by yet another scarcity of water:

'Then personally, I went to him. And I said "Ahh Mr Reynolds, for your safety, and for the safety of us all, you see, why can't you stop fostering the idea of enforcing the water rates. For us all to survive around here, don't foster, don't force. Give it as an official optional thing to the farmers. To those who feel, who want to pay. Let them organise on their own. We know that the water rates are required, but don't go too far.'

The next day the office clerk was instructed to write on the black board that all plot holders had to pay water rates before a certain date, or else they were going to be evicted. Tembani went to see his superior immediately:

'I said: "Mr Reynolds, your statement, you are seeing it as if it is good. Otherwise, the way I see it, why are you operating it in that way. Just talk to the headman and kraalheads, as you used to do. They will talk to their people. Let them solve those problems. Yours is only to receive the money." And for sure he thanked me for that. Then he resigned. He bade us farewell, and said he didn't like to die for the sake of dying. He was seeing the mistakes the former government was doing. He said, better he dies at his home in Britain.'

Reynolds left the scheme in April 1977. His successor, IM Young, noted that Reynolds had been quite lenient in running the scheme, allowing all sorts of illegal extensions. Young reported a certain reluctance in correcting the problem, since he risked becoming 'as popular

³⁰ The co-operative supermarket was opened again in 1978 and allowed to operate throughout the rest of the war. The comrades would occasionally send a boy with a list of goods they demanded, which were duly supplied.

as a pork chop in a Synagogue.' Still he managed to wrest an agreement from the kraalhead committee to stop any further illegal expansions of the scheme.

Meanwhile the African staff complement at Nyanyadzi were 'buying' their personal safety, by supporting the *vakomana*. Mutede:

'They would just write notes, and send a mujiba (young boy acting as messenger). Mutede I want this, and this. A hat, shorts, shoes, medicine, what, what. Sometimes we could pull together and then buy the goods as a group. It was the same with the teachers. That's how we managed to stay there. We were doing the whole thing at the office. That's where we received the notes, where we collected the stuff and put it in bags, and then somebody would collect the bags and deliver them to the boys.'

By supporting the war in this manner, the staff bought immunity from attacks, as Tembani related:

'We were told by the comrades that they would allow no one of us to be molested. We were also told not to leave the department, as they did with other government employees. Many groups passed through Nyanyadzi and we accommodated them all. But not even a single one of us was molested. But the district assistants now, Ahh, they were in hell.'

At least two Nyanyadzi plot holders who were employed as Police Reserve and District Assistant respectively, were abducted and killed by the *vakomana* during the war.³¹ Yet the whole matter of government staff supporting the comrades had to be kept secret from Rhodesian security forces. When irrigation supervisor Sithole was transferred to Nyanyadzi from Nyamaropa irrigation scheme, which had been closed in December 1978 on account of the war, he didn't know what the position of his new subordinates was:

'I received a letter from the comrades asking for help. But I didn't know what to do now, what the situation with the staff was. So I called them in my office, and let them read the letter. After they had gone through it, I burnt it. I said: "I don't know your position, but I have met the war. And I am passing it over to you. I don't know the way you are, you don't know the way I am, but I've just decided to make war. We should help." Then Mr Young, the irrigation manager popped in: "What are you discussing?" I said: "March out or you will be killed!" Then he walked out. And from there we played war with the comrades. (...) It was difficult. You had to assess the mujibas. You had to read them. Who is this? And some of the Selous Scouts too could look like comrades whereas they were not. They could track you, and say if you don't report (on the whereabouts of guerrillas, AB), you are in for it.'

Sithole and his staff only found out after the war that IM Young also made his contributions to the comrades. The practice of secret contributions in exchange for personal safety was quite widespread in irrigation schemes.^{xxx1} Some youngsters tried to exploit the secret exchanges for personal gain. Tembani knew of one case, where the impostor was caught by the *vakomana* and thoroughly beaten for extortion.³² Nyanyadzi shopkeepers experienced similar problems in supporting the *vakomana*. They all contributed to the war effort, often with knowledge of the local authorities, who found out through intelligence (CID) people,

³¹ The Reserve Policeman was related to the kraalhead in block C. The District Assistant had been warned by the comrades and had resigned from active duty at their request. However, when he was found in his plot carrying a gun, he was killed nevertheless. Interview with Mutede, 17 September 1996.

³² The case concerned a son of a well-known nationalist family in Nyanyadzi. He had forged a letter to extort some money from the local staff. Yet that very morning the staff had contributed already. Tembani: 'We wrote a covering letter to the comrades saying that we could not meet the demands, since we had contributed that very morning, unless we were given time. Then that just hit the guy. He failed to understand what was in our letter. So he was caught by the boys. Ahh, he was hit.' Interview with former extension assistant Tembani, Shinja, 10 June 1997.

imposing as bar men, or by means of strenuous interrogation.^{bccxii} The Selous Scouts, the most feared element of the Rhodesian Army, made active use of the practice to exact retributions. For instance, Selous Scouts pretending to be comrades killed the wife of Ndangana, the former leader of the Crocodile Gang, in her shop at Nyanyadzi.³³ Other shopkeepers were suspected to be sell-outs to the Smith regime by the *vakomana*, and had to flee.³⁴

Intensification of the war: splits and closure of the scheme (1978-9)

In December 1977, Ian Smith and his Rhodesian government entered negotiations with the so-called internal black political leaders (i.e. Muzorewa, Ndabaningi Sithole and Chief Chirau) for a transition to black majority rule. The internal settlement that was signed in March 1978 inaugurated the ill-fated Zimbabwe-Rhodesia government, which represented neither majority rule nor continued white minority rule. The main aims of Ian Smith, an end to international sanctions, international recognition, and an end to the war, were not achieved by the transition, since the fighting nationalist parties of Mugabe and Nkomo were no part of the settlement (Godwin and Hancock 1995). Rather the war intensified, and Nyanyadzi scheme, which harboured many Methodist Muzorewa and Sithole supporters, was turned into a battlefield. Ndabaningi Sithole had already been denounced a sell-out (traitor) to the African nationalist cause by the ZANLA forces in Mgagao in 1976 (Patsanza 1988, 127), but his active collaboration with Ian Smith combined with ruthless behaviour of the now more numerous ZANLA guerrillas, spelled disaster for the old guard of the Nyanyadzi nationalists.

Part of the internal settlement was the release of political detainees in April 1978 (Godwin and Hancock 1995, 221). Thus after three years the core of Nyanyadzi nationalists returned; only to find the situation drastically changed. Rishon Gwinya was one of them:

'The boys called us in the bush when we were released. They asked us "Do you support Sithole?" We didn't know what had happened in the meantime. But if you said "I support Sithole", they would beat you up. So we said we support Mugabe, but underneath we supported Ndabaningi Sithole. They would ask us "Who will be the first Prime Minister in Zimbabwe?" We had to say Mugabe.'^{bccxiii}

Robert Mukome, a nationalist businessman, refused to denounce Sithole after his release, and was subsequently killed together with his son by the *vakomana*.³⁵ Besides the detainees, also some stern Sithole supporters, who had gone to Mozambique to fight with ZANLA, returned after the internal settlement. They were deployed in an auxiliary force (called ZANLA-KAMPALA, later NDONGA) to rally support for Sithole's party in the elections of April 1979. According to Tembani,

'they were very cruel and harsh to the people. Yeah the way they were, I mean handling the masses... Ahh, the people were not happy about it. Their conduct was very bad.'^{bccxiv}

To complicate matters even further, Muzorewa and his UANC party deployed their own auxiliary forces, known as *pfumo revanhu* (spear of the people), supposedly to protect their supporters. The final years of the war are remembered by many Nyanyadzi plot holders as a

³³ The Selous Scouts were dressed up like comrades and sang revolutionary songs. A young man, who had acted as their *mujiba*, was also killed in the incident. Interview with Tembani, Shinja, 10 June 1997.

³⁴ The owner of Nyanyadzi hotel, Kayiboni, fled to Umtali, after the *vakomana* had machine-gunned his shop. The *vakomana* suspected Kayiboni of informing the Rhodesian authorities on their whereabouts. Interview with Luc Jambaya, Nyanyadzi, 7 June 1997.

³⁵ The Mukome killing is clouded in mystery. One rumour has it that Mukome tried to kill the *vakomana* by supplying poisoned food. Other rumours have it that he was sternly supporting 'president Sithole' (Sithole used to be president of ZANU, with Mugabe as secretary general).

dreadful time. Four different militias³⁶ were operating in the scheme, demanding support and threatening retribution in case such support was not forthcoming. The period sowed the seeds for the future splits.

Meanwhile manager Young and his staff tried to keep the scheme operational. However, when the water rates for the summer season of 1978/79 were due, the plot holders refused to pay. They had been instigated to do so by the *vakomana*, who wanted the people to withhold any support to the Muzorewa-Smith government.^{36xv} Nyanyadzi people were told at nightly rallies that in the future Zimbabwe there would be no water payments, nor any restrictions on crop choice and dry land cultivation. The IM was infuriated, and closed the scheme.³⁷ Around the same time Nyamaropa and Mutema irrigation schemes were closed, whilst Deure scheme was kept operational despite non-payment of water rates.

After four and a half months, in March 1979, the scheme opened again to allow planting of the winter crop. Supervisor Sithole actively mediated on behalf of the plot holders:

'The irrigation manager insisted that water rates had to be paid. I said: "How can they pay? They will pay when they have the money(...) When they have ploughed, you know, they have sold bit by bit, they can pay." That is how I won it.'^{36xxvi}

The manager wanted to clean the silted main canal by deploying the Rhodesian army. Fearing that soldiers and *vakomana* would 'ambush each other in the jungle there', supervisor Sithole undertook the work with the plot holders. The water rates were ultimately paid with deductions made from the bean crop proceeds. In August 1979 the DC suggested a similar approach for the next season, since

*'anyone paying voluntarily is running counter to terrorist instructions, with the obvious dangers inherent in that. If I force payment it could close the scheme.'*³⁸

Thus the war situation forced a more relaxed approach towards the management of the Nyanyadzi water-network. Events during the war were to inform future counter-discourses against the revival of Nyanyadzi as an irrigation factory, as will be shown in chapter 6.

5.5 CONCLUSION: REBELLIOUS WORKERS IN THE IRRIGATION FACTORY

Ironically, the gradual transformation of the Nyanyadzi water-network into an irrigation factory, through the enforcement of stricter technologies of managerial control, was determined to a large extent by the capricious behaviour of water. A plethora of plans to control its behaviour were developed by all government actors involved, yet full mastery over the flow of water remained elusive, making efforts to control the 'human factor' in irrigation more pronounced. This trend was reinforced by the Agrícolas' axiom of supervision and agricultural success and the recalcitrant behaviour of the plot holders that worried the scheme's Administrators.

³⁶ The four were Sithole's auxiliary force, Muzorewa's *pfumo revanhu*, the *vakomana* under direction of Mugabe's ZANLA forces, and the administration's forces consisting of the district assistants, police, central intelligence department and Rhodesian army.

³⁷ According to some, Young personally closed the gates at the main intake, sealed the scouring gate in the weir, and had the gates at the night storage dam demolished.

³⁸ The DC also suggested to write off the 1978/79 water rate collections for Chakohwa scheme, since Muzorewa (then prime minister) had promised at a meeting in Mutambara that people 'should farm for free'. PC files, Letter from DC Melsetter to PC Manicaland, 7 August 1979.

The concluding section first pays attention to the attempts of the Engineers, Agrícolas and Administrators to secure physical water control and the ramifications these attempts produced for the water-network. Next, the transformation of the scheme into an irrigation factory is presented by highlighting three consecutive cycles of boom and bust that precluded withdrawal of government control over the scheme. Finally a preliminary answer to the paradox of wealth and nationalist resistance is provided.

In search of the missing element: attempts to control water flows

The money spent on the gradual lining of the canal network, construction and cleaning of night storage dams, and repair and drainage work associated with storm and flash floods, provided the source of a small, yet continuous haemorrhage on the part of the Rhodesian state. To stop the bleeding a major storage dam would have to be constructed on the Nyanyadzi river.

During the 1950s all government resources for African development were directed towards the implementation of the Native Land Husbandry Act, precluding the building of the Nyanyadzi dam. Lacking the dam, the scheme's Agrícolas first mobilised a second ally to provide additional water for the network: Odzi river. However, the pump station took long to materialise. Funds for its construction were only secured by presenting the pumps and the additional water it would provide as an obligatory passage point to administrators who wanted to resettle expelled Africans from neighbouring European farms, and Agrícolas who wanted to implement the NLHA in irrigated settlements. Both required either additional land (and water), or the politically sensitive decision to evict large numbers of plot holders, producing scores of landless Africans.

Once constructed the pumping station added new dependencies, sources of expenditure and complications to the existing water-network. Canals had to be re-aligned to provide blocks A and B with pumped Odzi water, adding to the physical complexity of the network. The pumps had to be supplied with diesel, greatly increasing the expenses required for keeping the scheme operational. Furthermore the pumps were exposed to Odzi river silts and floods, which resulted in frequent breakdowns. For their repair the network depended on yet another institutional actor (engineers in the ID, later DWD), and spare parts imported from foreign countries. A final complication produced by the pump station was the fact that Nyanyadzi scheme now had to compete for water, not only with European farmers upstream in Nyanyadzi catchment, but also with a string of irrigation schemes in the Save valley.

During the reign of Internal Affairs over the network, the physical control over internal water flows was further refined by extensive lining of the canal network and the introduction of siphon irrigation, which increased water application efficiencies. An extensive network of automatic flow recorders on the Odzi and Nyanyadzi river provided the management with a knowledge base on the behaviour of these rivers. This allowed the management to predict looming water scarcities, essential for the application of water scarcity measures, such as the cutting of the winter crop acreage. Increased managerial control through the deployment of water bailiffs, also allowed the introduction of differentiated water rate payments depending on the irrigation interval. Yet, no water measuring network was set up inside the scheme, precluding the enforcement of 'scientific water management' based on crop water requirements. Despite frequent calls for such a measuring network, to allow for volumetric water payment and the full realisation of the irrigation potential, the management did not know exactly where the water stayed, once it had entered the arteries of the network. This provided the plot holders some leeway to expand the scheme at its fringes and irrigate

gardens. The limited control over water flows also precluded the use of water as an organising medium for the exertion of managerial authority, explaining the development and refinement of technologies of control that were mediated by land, crops and plot holders.

The concerted effort in the late 1960s to construct the Nyanyadzi dam also produced a number of ramifications. To legitimise both the priority and the expenditure involved in its construction, the management felt impelled to increase the network's cost recovery rate and production levels. At the same time, the envisaged dam storage allowed for further expansion of the network. When the coalition of interest built around the dam proved not strong enough, a second track was developed to end Nyanyadzi's water woes. This track involved the construction of a new and bigger pumping station on the Odzi river, North of the Nyanyadzi confluence, drawing its energy from a local power station connected to the electricity net. Whilst electricity probably represented a more reliable source of energy than diesel, the use of pumps rather than gravity canals to service the new irrigated areas fundamentally changed the modalities of operation and future potential for user management.

The road to the irrigation factory: recurrent eddies in a flow of increased managerial control

The two life phases treated in this chapter taken together with the preceding two life phases analysed in chapter 5 provide the basic story line of the growth of the Nyanyadzi water-network from its conception to full blown adulthood as an irrigation factory. Sticking to the biological metaphor, one could say that the MuNyanyadzi furrow experience was one of a moderately successful child that suffered from frequent illnesses and succumbed to a fatal one in the end (drowning). The lessons learnt from the experience resulted in the birth of a more successful child (the big Nyanyadzi scheme), that in spite of some childhood sicknesses (1942 strike), was capable of living up to the expectations of its founding father (Alvord). Next the disciples of the father nurtured the scheme into adulthood, a process that was marred by a turbulent adolescence (nationalist protest). Finally the young adult entered his career as a full-time worker under the guidance of the administrator and reached full maturity.

How did the Agrícolas and administrators raise Alvord's child to full maturity? The basic DNA material had already been provided by Alvord's two levelled sociotechnical model of modernisation. The subsequent care takers only provided minor corrections and adjustments on this model. The Agrícolas strongly believed in the merits of a strict education and sought to put the plot holders on a firm agricultural footing, maximising agricultural output per acre. The basic tenets of the NLHA, i.e. cultivation under government supervision and allocation of land holdings by the government to nuclear families, had already been attained in the Nyanyadzi water-network. Yet the problem of over-grazing and economic viability stipulated the enlargement of the average plot holding size to 4 acres, one of which was to be used for irrigated pasture. This slight modification in plot size implied an adjustment to the model of the irrigating household: women plot holders were to be removed, since these were considered less productive than their male counterparts or in the case of polygamous households only served to expand the land holding base of their husband. Lacking an additional source of water to service all remaining male plot holders, this modification was ultimately not implemented. The erosion menace contained in the growing cattle herds, which were required to provide draught power and fertility (manure) for the scheme, was resolved by the plot holders themselves, who sent their cattle to graze across the river in the sparsely populated Bocha area.

The Agricolos did succeed in increasing the agricultural output and producing agricultural welfare in the scheme. This feat was ascribed by the Agricolos themselves to the beneficial effect of enforcing strict managerial control. Whilst this undoubtedly played a role, the introduction of hybrid maize, a new market (Liebigs in Cashel) and a new form of cash crop production (contract cropping), is likely to have contributed the lion's share of the increased production and welfare. Meanwhile the scheme and its inhabitants became celebrated icons of modern African society: the majority of the plot holders stayed in square brick houses, along straight roads, and some of the more educated and entrepreneurial amongst them developed local businesses and crafts or took up a leading role in the church or Cooperative Society.

The administrators model of modernisation provided more of a radical break with the past ideals of a modern agricultural community, whilst firmly subscribing to the need for strict government supervision. Their emphasis was on maximising settlement per acre as reflected in the proposed reduction of plot holdings to 2 acres. The main transformation lay in the model of the plot holder. Whereas Alvord had nurtured the idea of an independent monogamous family that engaged in professional ploys and provided its own community leadership on the basis of a Christian meritocracy, the administrators favoured the idea of an African tenant or worker, disciplined by a revived tribal authority. Alvord's community development ideas were put on a firm tribal footing, whilst the rural industrialisation policy was revived under a new cloak in order to cater for a growing and dangerous multitude of unemployed youths ('useless hangers-on'), that had been attracted to the scheme on account of its agricultural wealth. Nyanyadzi's woes had been caused, in the eyes of the administrators, by a lack of tribal cohesion and the ungrateful and restless behaviour of uneducated kinsmen that had flocked to the scheme. For the sake of national security the movements of the scheme's inhabitants had to be controlled, inaugurating the establishment of a protected village.

The new order announced by Internal Affairs was, however, impaired on the ground, and fraught with contradictions. Lacking the tribal cohesion required, disciplinary powers were centralised in the hands of the manager. This move in itself undermined the emergence of a credible tribal authority. Increased emphasis on cost recovery and high productive output, necessary to turn Nyanyadzi into the core estate of a much larger irrigation network that included the dam, led to policies that favoured the issue of more plots to industrious plot holders and the eviction of mal-performers. The production output per acre was maximised rather than settlement per acre. Under the new dispensation the Nyanyadzi water-network attained the highest yields and biggest share of commercial crops in its life.

One striking feature of Nyanyadzi scheme, which is borne out by the technography, is that every life phase consisted of a cycle of boom and bust. Each cycle comprised a sequence of firstly the re-alignment and addition of constituent elements along the lines of the new intervention model; secondly the attainment of production increases; and thirdly, moves towards government withdrawal and devolution of management tasks to the users. However, each time the intended withdrawal and devolution was aborted, inaugurating a regime change in the management and modified model of intervention, entering the next cycle. The cycles can be conceived as eddies in the dominant stream of increased government control over the water-network.

After the first profit and inauguration of a plot holder committee in 1945, the government seemed to ready itself for a hand-over of the scheme to its users. But, the combined effect of

Alvord's foiled attempts to build up rural agro-industries that preyed on government resources; the Agricolas' commitment to strict supervision resulted in the expansion of government staff; and the Administrators' reluctance to devolve marketing and management tasks to the users, precluded such a withdrawal. The whole matter hinged on the issue of cost recovery. Until such time as the plot holders were capable of paying the running costs of the network, no actual hand-over would be favoured.

This principle was given official status in the subsequent government irrigation committees of 1955 and 1961. Whilst the ongoing specialisation and devolution of management functions in the Co-operative Producers' society (1959), Nyanyadzi kraalhead committee (1958), and spread of plot holder committees across the Save valley irrigation settlements (1962) were signs of government withdrawal, the ultimate hand-over again hinged on the issue of cost recovery. The addition of a pump station to the Nyanyadzi water-network seriously impaired the financial viability of the scheme. Moreover, the violent opposition of African nationalists in the scheme and subsequent rise to power of the administrators took away the political feasibility of a hand-over.

The final though feeble attempt to hand-over more management responsibilities to the scheme's users occurred in 1975. The stated policy aim of community development foresaw the hand-over to a strong tribal land authority. Yet the Nyanyadzi kraalheads, fearing repercussions from the nationalist parties that had gone to war, actively resisted the formation of such a tribal authority. They appointed local nationalists as their secretaries to act on their behalf and sought exclusion from official fora where future hand-over of community development responsibilities was discussed. The subsequent intended hand-over of the scheme's management to the newly formed African district council could not be effectuated on account of the expenses involved in keeping the pump station operational. The tireless efforts to turn Nyanyadzi into a core estate hinged on increased government supervision and expenditure. Whilst water rates were increased, the costs of running the network also rose (certainly after abandoning the gravity irrigation option). This meant that the issue of cost recovery once more precluded government withdrawal.

Nyanyadzi's life as an irrigation factory was short, starting somewhere in 1968 and ending more or less in 1978 with the closure of the scheme. Yet the effect and example set by the most productive period in its life would linger on for some 15 more years, particularly within the ranks of the Agricolas (see next chapter). The intensifying war and promises of free irrigation services after the conclusion of the war by the freedom fighters, made it very difficult to revive the scheme once more as a factory scheme. Yet, initially the guerrillas allowed all irrigation schemes to continue functioning. One reason was that both the scheme's plot holders, and the staff, were useful in providing hard needed food and other basic necessities to the guerrillas. Closure of the schemes would deprive the guerrillas of these supplies. As the war intensified, and became more acrimonious under the Muzorewa regime, ZANLA cadres were instructed to fight all possible sources of assistance to the regime. The plot holders were instigated to refuse water rate payments. This led to closure of a number of irrigation schemes, including Nyanyadzi, whilst others (Deure) were allowed to continue, depending on the discretion and strictness of the resident Irrigation Manager.

The question of African nationalism: a preliminary answer

The outbreak of African nationalist resistance in Nyanyadzi in the early 1960s was largely inspired by motives that stretched beyond events that took place in the scheme. However, the discontent, which laid at the basis of violent action against the scheme's management and

government administration, was not completely divorced from the management style that was imposed on Nyanyadzi plot holders. The African nationalist cause and successive nationalist organisations did provide an avenue to articulate and express discontent that no other avenues had provided before. Its influence lasted beyond 1964.

Amongst the Agrícolas the dominant belief was that nationalist urban politicians had cleverly exploited the sense of insecurity that 'ignorant', uneducated plot holders experienced in the scheme. It was felt that these uneducated Africans failed to appreciate both the needs for strict technocratic control in irrigation *and* the difference between bureaucratic and tribal authority (cf Weinrich 1971). None of the Nyanyadzi plot holders had been evicted, yet many felt as if they could be evicted at the whim of the white LDO. In Plowes' view some urban politicians linked up with local teachers and the Co-op leadership and instigated a majority of contented plot holders to turn against their benefactors. Their actions were irresponsible and opportunistic in his eyes, since promising free services for all and abolishing disciplinary control in irrigation would result in environmental damage and loss of wealth.

The administrators blamed the unrest on a lack of tribal cohesion and discipline. This explanation was rooted in the evaluation of the violence that had been inspired by the NLHA: the government had over-looked the 'human factor' in African development. People of various tribal backgrounds had been settled in Nyanyadzi, against the advice of previous district administrators, and moreover the existing tribal leadership was considered weak. The administrators' preferred remedy was the formation of a strong tribal land authority that was capable of enforcing the discipline required in irrigation. In the meantime, the management would have to instil the discipline that was innate to irrigation. To cater for those not beneficially engaged in irrigation, useful employment would have to be created by promoting various strands of community development.

Both groups held the unemployed and uneducated responsible for the violent outbreaks of resistance in Nyanyadzi, with the possible exception of the top provincial Agrícola, Plowes, who attributed an instigating role to a tiny elite of educated Africans. Yet from the evidence provided by both Sithole and the Nyanyadzi nationalists themselves it transpires that resistance was primarily instigated by the wealthy mission educated members of the Nyanyadzi community. Thus it was Alvord's modern men and women that took the lead in the articulation of nationalist desires. Both Rennie (1973) and Sithole (1968, 1970) point at the critical role of the Methodist mission stations in nurturing new forms of organisation and the articulation of African desires to be treated at par with their European counterparts. The desires of this modern African elite for better education, better wages and better business opportunities tied in with simmering fears among the mass of Nyanyadzi plot holders of an impending loss of cattle and plots.

At Nyanyadzi there were basically two groups of African nationalists. Firstly there was an older generation of moderate modernists, that had experienced intense upward mobility on account of their mission education (see chapter 2). They firmly subscribed to Alvord's modernisation project and had been attracted to the scheme on account of their profession (teachers, businessmen, and craftsmen) or because irrigated agriculture provided an attractive source of livelihood. Their aspirations were moderate and their means of achieving them firmly in line with the idea of racial partnership and responsible leadership. A second group consisted of their mission-educated sons, who acted like angry young men. They had enjoyed the fruits of the upward mobility of their parents, identified strongly with the idea of a non-racial Christian meritocracy, and wanted better conditions of employment. Their means of

achieving their rightful place under the Rhodesian sun were more radical and turned more violent when constitutional means failed.

What was the role of irrigation in all this? Basically irrigated agriculture provided the means of achieving a modern livelihood. The first generation nationalists keenly invested some of this wealth in the education of their sons and daughters. These then formed the second generation of nationalists that engaged in violent acts of resistance, and sent their children to war. The intricacies of this process of agricultural wealth accumulation and the subsequent differential impact of the war on the Nyanyadzi community is the subject of chapter 7.



Photo 8: Odzi river at Nyanyadzi pumphouse, end of 1995
(Source: Alex Bolding photo)



Photo 9: Odzi river at Nyanyadzi pumphouse, March 1996
(Source: Alex Bolding photo)



Photo 10: Water bailiff block C, opening an offtake gate along the main canal, June 1997
(Source: Alex Bolding photo)

THE MANAGEMENT: IRRIGATION MANAGEMENT TRANSFER BY DEFAULT¹

'Irrigation is like riding on a wild horse' (Nyanyadzi irrigation supervisor commenting on his daily work practice, August 1995).

After Independence the Zimbabwe government, headed by Mugabe's ZANU(PF) party, directed the thrust of its development efforts towards the hitherto neglected smallholder farming sector, whilst maintaining the technocratic intervention rationale of past agrarian policies. A critical role in the development of rural areas was attributed to smallholder irrigation schemes, which were to form the core of rural growth points. The lift of international sanctions opened the door to international funding and a multitude of (inter)national development aid agencies.

Internationally, the dominant discourse on irrigation management incorporated shifts in both the onus and focus of management. The focus had shifted from plot level to main system management (Chambers 1988), whilst the onus for both development and management of irrigation schemes had shifted from the state to a combination of the market and the actual users, along the neo-liberal mantra of 'less state, more market, more users' (Repetto 1986, Ostrom 1990, 1992). Largely informed by developments in Asia, public irrigation agencies came to be seen as obstacles for further irrigation modernisation and growth. The irrigation bureaucracies were considered hierarchical, expensive to maintain, irresponsible to user demands, and prone to corruption and political nepotism (Repetto 1986, Wade 1982). Three policy reforms were advocated by the new international policy discourse, entailing (a) the introduction of water markets through volumetric water distribution and pricing; (b) the establishment of financially autonomous irrigation agencies that were accountable to their clients instead of to the state; (c) promotion of self-governance and irrigation management transfer from public irrigation agencies to water user associations (Oorthuizen 2003, Rap 2004).

This chapter seeks to understand not only how changes in international policy discourse impinged on Zimbabwean discourses, but also how these changes in turn informed the model of scheme management in Nyanyadzi. How did the Nyanyadzi management exert water control in the face of a series of droughts during the early 1980s and 1990s? Did the Nyanyadzi water-network and model manage to perform successfully under the new political dispensation?

The chapter opens with a review of government and donor-initiated attempts to formulate a national irrigation policy that stressed the benefits of increased cost recovery through user involvement in irrigation management (6.1). Thereafter, we return to Nyanyadzi, where the management frantically attempted to prolong the life of the water-network as a state-run

¹ Parts of this chapter have been published earlier in Bolding (1996) and Bolding, Manzungu and Zawe (2004).

irrigation factory (6.2). How the management and the plot holders dealt with the vagaries of a water scarcity is presented in 6.3 for the 1995 winter season. The next section (6.4) deals with the involvement of the Irrigation Management Committee in managing the scheme and the abrupt irrigation management transfer from the government to Nyanyadzi's politically divided users after 1996. In the conclusion (6.5) an analysis is given of the failed attempt of the management to revive the Nyanyadzi water-network as an irrigation factory.

6.1 POST-INDEPENDENCE POLICY DISCOURSE ON IRRIGATION MANAGEMENT

One of the important features of smallholder irrigation development in post-independence Zimbabwe has been the absence of a clear policy. Many commentators have stated that policy in the smallholder irrigation sub-sector in Zimbabwe was never adequately developed (see Chabayanazara 1994, Chitsiko 1995, Hughes 1974, Mupawose 1984, Roder 1965). As shown in the preceeding two chapters for Nyanyadzi, policy aim and direction tended to change during each life phase of the scheme, depending on the policy actor in charge. The longest serving director of Agritex, Makadho (1994, 20), more or less confirmed this trend when he stated that, 'irrigation policy is not in black and white: it is only understood.' What follows is an account of some attempts at smallholder irrigation policy formulation after independence. First an overview is provided of the role of the post-colonial state in irrigation, and that of (inter)national funding agencies in particular. This might help explain the lack of a smallholder irrigation management policy.

The role of the post-colonial government and donor agencies in smallholder irrigation

Rehabilitation with donor funds and continuation of colonial agrarian policies

After independence the public service was expanded and Africanised. The latter process did not produce new attitudes and practices, since many of the promoted African civil servants had received their training within the Rhodesian state (Alexander 1994, 326). The new government, by mouth of the Riddell (1981) and Chavunduka (1982) commissions, did not challenge the beliefs and practices which had informed the technocratic and segregated development policies of the Rhodesian era. This continuity was reflected in the reproduction of the same assumptions on the wasteful and environmentally destructive qualities of African farming practices, that were held by a now expanding bureaucracy, still largely unaccountable to representative institutions (Alexander 1994, 323-33; see also Drinkwater 1989, 1991). Resettlement and irrigation schemes were envisaged as self contained islands of modernisation, where settlers 'were expected to sever all social and cultural ties with their past lives in order to achieve new levels of productivity under the tutelage of the state' (Alexander 1994, 334). During the 1980s the United Nations High Commission of Refugees (UNHCR) and United States Agency for International Development (USAID) funded the rehabilitation of irrigation schemes destroyed during the liberation struggle, whilst little new irrigation development was taken up (GKW 1985). Most of the public resources were availed to establish schools and to procure European farmland for the resettlement programme.

Fragmented bureaucracy

By the late 1980s emphasis had shifted from rehabilitation to management and development of new irrigation projects to fully utilise the available water resources. The government adopted a policy of equal access by both blacks and whites to development funds for new irrigation projects. However, the mandate for irrigation development and management was split among three departments: the Department of Rural Development (Derude) in the Ministry of Lands, Resettlement and Rural Development; Agritex in the Ministry of

Agriculture; and DWD in the Ministry of Water and Natural Resources. Derude was responsible for the management of irrigation schemes, Agritex for agricultural extension,² while DWD was responsible for water delivery to the irrigation schemes. The divided responsibility brought some problems in the development of smallholder irrigation, as voiced by Chitsiko (1988, 70):

'Co-ordination of the departments was poor and their co-operation inadequate. Staff members of the departments were confronted with the problem of divided loyalties. Personality clashes between management and extension staff at some schemes have not helped matters either'

As a result effort and debate centred more on clarifying the roles of the different organisations than on an actual policy on smallholder irrigation management. It was only in July 1987 that the irrigation component of Derude was transferred to Agritex, effectively placing both the extension and management functions into a single department (Chitsiko, 1988). However the development of the water source and subsequent delivery of the water to the irrigation schemes remained the responsibility of the DWD, which was poorly represented on the ground. These divided responsibilities would cause considerable frictions particularly at times of water scarcity. To make matters worse there were two types of water available. Water contained in government dams (like Osborne dam) was known as agreement water and was sold to interested parties by the Provincial Water Engineer (PWE) against the national blend price for water. The actual allocation of this water was not subject to any government regulation, and was undertaken at the personal discretion of the PWE.³ A second source of water, normal river flow, was allocated free of charge amongst water right holders according to their respective priority dates.

Donor support and invisible farmer rights

During the period 1980 to 1997, the smallholder irrigation sub-sector enjoyed massive donor assistance. The government departments mandated with irrigation development found it difficult to deal with numerous funding institutions and their different funding conditions. The result was confusion at grassroots level, where officers were not sure what to tell the farmers as the correct funding procedure and why that procedure was used and not another to establish a neighbouring irrigation scheme. Only scant attention was paid to the rights of the plot holders, in contrast to their obligations. Yet, the command area under smallholder irrigation steadily expanded, comprising 4,270 ha in 1983; 4,572 ha in 1990; and 9,958 ha in 1997 (GoZ 1997, 9; see table i.3). Supported by ample donor funds the irrigation engineering division within Agritex grew both in influence and staff numbers.

The adoption of neo-liberal economic policies after 1991 gradually led to decreased government funding for operation and maintenance of existing schemes. This resulted in irrigation management turnover by default in the majority of the schemes towards the end of the 1990s, as the government could no longer honour its financial obligations. Meanwhile donor funds were used to experiment with new forms of smallholder irrigation development and management. However, political events in the late 1990s, entailing massive land invasions by war veterans and state orchestrated oppression of opposition parties, precluded continued funding by both international and bi-lateral funding agencies. The involvement of the users in financing the running costs of smallholder irrigation schemes became the new catch phrase of the day.

² This separation of management and extension functions had been informed by extension personnel who despised their dual role as policemen and agricultural advisors to irrigating smallholders.

³ During the 1990s an inter-ministerial committee (the so-called Mead committee) was formed that submitted requests for agreement water on behalf of smallholder irrigation schemes.

Attempts to formulate a national irrigation policy

The Derude policy (1983)

In 1981, Derude took over responsibility for the construction and management of smallholder irrigation schemes from the Department of Agricultural Development (Devag). In April 1983 Derude published a policy paper on small-scale irrigation schemes.⁴ The document was a mixed blessing, since it beset the smallholder irrigation sector with a host of, sometimes contradictory, objectives, basically comprising all policy aims that had been applied in the past. These ranged from the provision of food security, the generation of rural employment, the production of export crops, and relief of population pressures on the land to the ignition of a rural industrialisation process. The policy left room for local interpretation as to which goal should receive emphasis. One could either maximise settlement and food security by decentralising decisions on cropping strategies to as many plot holders as possible, or alternatively maximise production by centralising management in the hands of the irrigation manager. The same ambiguity was reflected in the policy's management strategy. The fact that the irrigation manager could withhold three annually renewable permits to plot holders on account of lacking performance, suggested a continuation of the disciplinary irrigation factory policy. On the other hand, the policy proposed a gradual turn-over of operation and maintenance responsibilities to users by increasing their financial contribution and forming Irrigation Management Committees to achieve self-management (box 6.1).

The document was silent on the rights of irrigators. For example, ownership and user rights of irrigation infrastructure after hand-over were not clarified. Also, no time schedule or criteria were provided to indicate when and how irrigation schemes qualified for turnover. Despite the fact that the Derude policy was never endorsed as official policy, it is considered the most definitive statement of smallholder irrigation policy in Zimbabwe (Meinzen-Dick 1993, 35).

Box 6.1: Aims of Irrigation Management Committees

According to the assistant director Derude, later director of Agritex, the aims of the irrigation management committees were:

- (1) To enhance farmer participation in management and decision making at the local level.
 - (2) To prepare the farmers for a complete take-over of management functions currently carried out by government;
 - (3) To create a responsible attitude and a sense of belonging to the scheme so that farmers could view the schemes as theirs and not simply a government project;
 - (4) To introduce a self-regulatory, self-disciplining machinery at the irrigation scheme to enhance maintenance of discipline, cropping patterns and recommended agronomic practices. (Pazvakavambwa 1984, 423)
-

The ambiguities contained in the policy soon led to inter-departmental conflicts over its implementation. Top level Derude staff insisted that the IMC approach was necessary, because the plot holders were no longer prepared to co-operate with old style Irrigation Managers. Such was manifested by the widespread defiance of irrigation rules and non-payment of water rates in the schemes during the first years after independence. The careful and difficult process of strengthening IMCs was meant to obviate the need for strict government supervision and continued subsidies on operation and maintenance.¹ However,

⁴ The policy was formulated at directorate and provincial level by a variety of officers that originated from DEVAG and CONEX, since the document reflects a mixture of old ideas and new initiatives. Note that the director and deputy director of Derude later became successive directors in Agritex, in 1985 and 1988 respectively. These two were the prime movers behind the subsequent take over of smallholder irrigation schemes by Agritex in 1987.

Devag and Agritex staff on the ground interpreted the policy as a continuation of the colonial management style, whereby IMCs were used to enforce discipline amongst the plot holders, thus ensuring sustained productivity of the schemes. The latter view won the day when Agritex replaced Derude as managing agency for smallholder irrigation in 1987.

National Farm Irrigation Fund (1985)

The aim of this fund was to provide smallholder farmers with access to cheap money for irrigation development. Smallholders organised in groups could borrow money for the purchase of irrigation in-field equipment at low interest rates. Government remained responsible for financing main system irrigation equipment, since the practice of communal land tenure precluded the use of land as collateral. Still, it was hoped to reduce government spending on the development of smallholder irrigation schemes by involving the users in financing at least part of the costs. The loan facility was also meant to ease irrigation management turnover to the farmers. However, the ownership rights of the irrigation equipment were not clear. The effort came to naught, as the smallholders hardly made use of the loan facility (Rukuni and Makadho 1994, 136). Electoral promises by the state president and various ministers to provide each district with a dam and smallholder irrigation system free of charge⁵, as well as the availability of donor support to smallholder irrigation development at no charge to the ultimate users, severely undermined the policy.

The FAO initiative (1990-1994)

In 1990 FAO and GTZ (a German development agency) financed the development of an irrigation policy and strategy in Zimbabwe. The status of the resulting report (FAO 1994) is disputed. Some claimed this was the policy in force, while others felt it was not. At best it has been described as a semi-official document, since the government never endorsed it as policy. The document called for improvement of the prevalent low levels of water use efficiency by adopting sprinkler and drip technology and handing over responsibilities for operation and maintenance to the users. To this end effective Water User Associations were to be established, replacing the largely ineffective Irrigation Management Committees. The policy also proposed stringent financial reforms consisting of a water pricing policy that reflected the scarcity value of the commodity water and the recovery of operation and maintenance costs directly from the beneficiaries. Any subsidy of O&M costs were to be justified and targeted on a case by case basis. Whilst it was proposed that development of irrigation infrastructure on state land remained a government responsibility, private sector investment in irrigation was to be encouraged. In the wake of the FAO policy several cohorts of Agritex officers were trained as irrigation engineers, greatly enhancing the design capacity of the irrigation division in Agritex.

Decentralisation Policy (1991-1993)

The goal of this national policy was to promote a system of local government, based on decentralisation of authority and involving people's participation in all governance processes. Early attempts to establish local governance structures had resulted in the formation of representative bodies at village (VIDCO), ward (WARDCO) and district level (District Council) in 1984. These elected bodies were meant to replace Rhodesian governance structures that had been dominated by traditional leaders. At the same time central government hoped to establish control over local party committees that had managed local development in liberated areas. However, civil servants of various ministries, representing different technical disciplines, dominated the decision-making bodies⁵ of this system of local

⁵ Development planning and decision making was done in District Development Committees and Provincial Development Committees that consisted of government bureaucrats and very few elected representatives.

governance. Ministries regarded local authorities primarily as policy implementing, not policy formulating, agencies. People's participation, in their view, meant assent and compliance, thus easing the implementation of centrally formulated government policies (Alexander 1994, 329-31).

The Rural District Council Amalgamation Act of 1991 (implemented in 1993) represented a more serious attempt to reduce the involvement of line departments in the administration, operation and management of local projects, including smallholder irrigation projects. Heavily supported by donor funding, Rural District Councils were expected to enhance their professional capacities and replace government experts with their own staff. However, line ministries resisted the devolution of authority, fearing the dominance of party politics over administrative and technical competence. Local bureaucrats became highly legalistic in their orientation, resulting in confusion as to who was responsible for local affairs (Roe 1995, 839). Council officials felt inexperienced in dealing with their new authority in, among other things, irrigation management, in most cases leaving day-to-day management in the hands of line ministries (see 8.3).

The National Water Policy and Strategy (1995-1998)

This policy aimed at re-distributing access to water, commercialising government departments involved in water management and involving water users in the development and management of water on a river basin scale. The water reforms culminated with the adoption of a new Water Act (1998) and the privatisation of the DWD into the Zimbabwe National Water Authority (ZINWA), a para-statal agency providing services on a cost recovery basis. Catchment councils were established in the country's eight major river basins, comprising all stakeholders and involving them actively in allocation of water permits and development of new (irrigation) infrastructure. The immediate effects of the 1995 policy were increases in the national blend price charged for agreement water and the removal of electricity subsidies on pump operated smallholder irrigation schemes. This seriously affected the operation of many smallholder irrigation schemes.

The Zimbabwe Agricultural Policy Framework (1996)

The Zimbabwe Agricultural Policy Framework was launched in August 1996 and contained national objectives and policies for the agricultural sector as a whole. The policy provided only a general framework reflecting several ongoing policy trends without specifying implementation guidelines. It was formulated to facilitate the release of international funding for the implementation of World Bank mediated Public and Agricultural Sector Investment Plans. With regard to the smallholder irrigation sector the policy calls for increased commercialisation of irrigated production, sustained growth of irrigated area, establishment of an efficient institutional structure, and equitable and efficient use of scarce water resources by means of a new water pricing policy. The framework guided irrigation management reforms that were implemented by (inter)national funding agencies. These included the FARMESA project, financed by FAO and Sida (a Swedish donor agency), developing methodologies for irrigation management transfer in government run irrigation schemes (Manzungu 1998), and the Smallholder Irrigation Support Programme (SISP), financed by IFAD and DANIDA (a Danish donor agency). SISP aimed to test and develop turn-over models, formulate an overall plan for irrigation management transfer, and strengthen the organisational capacity of rural district councils, irrigation service institutions and farmers by means of training. The programme also sought to rehabilitate some 1,300 hectares of existing schemes before turnover, whilst developing some 700 hectares of new smallholder irrigation schemes under farmer management (GoZ 1997).

Conclusion: the emergence of donor initiated policy discourse

In conclusion it can be argued that an elaborate policy discourse developed. This policy discourse stressed the need for irrigation management turnover for reasons of supposed better performance and most importantly for reasons of improved cost recovery. The discourse is silent on the rights and responsibilities of the users. Moreover, it had not been translated into public policy statements endorsed by cabinet, law, or implementation guide lines for use by the staff of the relevant departments and other actors involved in irrigation development. As a result Irrigation Management Committees on most schemes lacked a legal basis for sustained operation. The strong continuity of colonial agrarian policies combined with ample donor support resulted in an expanded rather than a diminished role of government in smallholder irrigation. Attempts to decentralise and devolve authority to locally elected bodies were actively resisted by an expanding state bureaucracy (*cf* Ferguson 1990). Ultimately severe budgetary pressures experienced towards the end of the 1990s precipitated a process of financial devolution from the government to the farmers.

The contradictory effects of ample donor support: brain-drain and enterprising bureaucrats

The very lack of a definitive policy statement on smallholder irrigation development combined with the political expediency of promoting smallholder irrigation as a vehicle for development during the devastating droughts of the early 1990s, led to a veritable flood of donor-initiated funding for the sector. It became customary for any bi- or multi-lateral donor agency interested in smallholder irrigation to start its activities with a kick-off workshop that sought to address the lacuna of an irrigation policy. The workshops invariably took place in one of the lush tourist resorts or conference centres of the country and were attended by a variety of stakeholders from the government, NGO and private sector, though rarely by smallholder irrigators themselves.

The average number of donor-funded workshops that bore a relationship to water development or management in the smallholder sector amounted to at least twenty per annum. If one adds the annual workshops of the Agritex irrigation branch, the time spent on workshops for the average provincial irrigation specialist during the mid-1990s amounted to at least 10% of total working time. In response to the massive availability of donor funds,⁶ top-ranking officials in the Agritex irrigation branch and head office started private consultancy firms that provided the research and policy inputs for some of these policy formulation initiatives. Such activities were lucrative and often exceeded annual salaries. However, the opportunities to engage in such activities were cautiously guarded at the level of the directorate, causing resentment in the lower ranks of the organisation. Donor agencies on their part appreciated the input of high-ranking bureaucrats, hoping that this would commit the government to the cause of irrigation management transfer.⁷

The proliferation of irrigation projects and the competitive wage packages offered by the donor agencies contributed to a brain-drain of the best qualified engineers from the public

⁶ The relative magnitude of donor support can be gleaned from the SISP project (GoZ 1997). The costs amounted to some US \$16.5 million of which US\$14.9 million was funded by IFAD and DANIDA. The total annual budget for Agritex in the 1995-96 financial year amounted to Z\$ 228 million, or US\$ 26.1 million at the 1995 exchange rate, of which at most 5% was spent on irrigation (GoZ 1995).

⁷ The SISP formulation report proudly mentions the inclusion of two top level public servants in the project formulation team: 'It is expected that the participation of these officials will enhance Government ownership of the programme, assist the team to be fully aware of GOZ (Government of Zimbabwe) concerns, and ensure both continuity in the programme design and institutional memory within the MLA (Ministry of Agriculture).'

sector to the donor sector. Thus the Agritex office for Manicaland province lost one of its two irrigation specialists in 1997, and its chief agricultural extension officer in 1998. Both resigned to take up careers as project officers for the EU funded Small Scale Irrigation Programme and IFAD-DANIDA funded Smallholder Irrigation Support Programme respectively.

6.2 ATTEMPTS TO REVIVE STATE CONTROL OVER NYANYADZI SCHEME

To what extent the new policy discourse and political dispensation of independent Zimbabwe impinged on the management of the Nyanyadzi water-network is assessed below.

1980: A new start with a popularly elected Irrigation Management Committee

The Lancaster House independence negotiations reigned in a new dawn by the end of 1979. The white irrigation manager had allowed Nyanyadzi irrigation scheme to operate on condition that water rates were paid after harvesting the crops. However, when the time of payment was due (April 1980), the kraalhead committee on behalf of Nyanyadzi plot holders refused to pay. Thus the committee cashed in on promises of free government services after independence, made by freedom fighters during their nightly rallies. This promise had been reiterated by the newly elected Member of Parliament for Chimanimani district during his victory speech, when he suggested that water rate payments should be done away with. The out-going white District Commissioner, however, stood firm and suggested to the new Minister of Local Government to cut off water supplies to the scheme in case the kraalhead committee persisted in its refusal to pay. To resolve the ensuing standoff, a team of government officials visited the scheme in May 1980. Their investigations revealed that the plot holders had a number of grievances regarding enforcement of water rate payment during water scarce years and exploitation by the marketing co-operative.

Besides promising the rehabilitation of the canal infrastructure of the scheme and construction of a new pumping station, it was decided by the visiting officers that the existing kraalhead committee should be done away with and be replaced by a popularly elected farmer committee.⁸ Two farmers from each block were selected to sit on the committee, which consisted of a chairman, vice-chairman, secretary, vice-secretary, treasurer and three ordinary members. The duties of this Irrigation Management Committee (IMC) were:

- (a) To communicate problems and bring solutions
- (b) To discuss problems with the irrigation manager
- (c) To recommend individuals for plot allocation
- (d) To disseminate information among plot holders.ⁱⁱⁱ

It was hoped that the freshly promoted African irrigation manager and newly elected IMC would resolve any outstanding problems.

However, with water shortages persisting and local politicians calling for a new order based on free services by government, Nyanyadzi plot holders kept refusing to pay their contribution towards operation and maintenance of the scheme in the early 1980s. Yet, the plot holders' contribution (at Z\$35 per hectare) only covered 23% of the required expenditure

⁸ This move towards democratically elected structures of local governance was one of the policy priorities of the new ZANU (PF) government. The new structure of local governance was intended to sideline the traditional leaders (Chiefs and headmen) who were accused of being collaborators of the Smith regime during the war (Kriger 1988, Ranger 1985). Since most members of the new committee were drawn from the local ZANU(PF) party branch, it was also a move to facilitate control of the ruling party over an area that was known for its support to an opposition leader (Ndabaningi Sithole).

to keep the scheme operational. It was left to the local Derude staff to resolve the contradictory demands exerted on them. The new irrigation manager for Nyanyadzi and his African staff of extension assistants and water bailiffs were bent on reviving the old management style. Decisions on cropping programmes, water distribution schedules, maintenance activities and agricultural operations remained the prerogative of the Irrigation Manager. The IMC was instructed to draft by-laws that emphasised the maintenance of discipline, spelling out appropriate punishments for violators of the rules. The IMC was only called to meetings to be told what to do by the irrigation manager. This process was however, not as straight forward as it seemed. Considerable skills were required on the part of the irrigation manager and his staff (see box 6.2).

Efforts to revive the old management style (1984-1993)

In 1984 water charges were re-introduced in Nyanyadzi, this time called maintenance fees, at the rate of \$145 per hectare (covering 21% of the O&M expenses). Since payment was now done towards maintenance of the scheme and not towards water delivered, the recurring issue of waiving water fees in years of water shortage could henceforth be avoided. Nyanyadzi scheme and its management were however confronted with four thorny issues that required appropriate action: competition for Nyanyadzi river water with upstream irrigators; illegal cultivation along the main canal; water stealing by plot holders in the top end block C; and continued deference of maintenance fee payments by a majority of plot holders. Government staff tried to resolve these problems by invoking the factory management style.

Towards the beginning of the dry, winter season of 1984, the (white) deputy director Agritex urged his counterpart at Derude to do something about the imminent water shortage at the scheme, which was attributed to illegal water abstractions upstream of the Nyanyadzi river intake. The (white) Provincial Irrigation Officer for Manicaland promptly reacted by issuing an order to all IMs and IMCs to stop illegal extensions and water abstractions. Faced with a total breakdown of the Odzi pumping station, manager Sithole resorted to drastic action in October 1984. Desperate for water he organised an upstream raid along Nyanyadzi river destroying all irrigation furrows that were found to abstract water. To his own surprise, Sithole ended up in prison for his action and was made to understand that he could not interfere with upstream furrows that had been issued water rights by the District Administrator. IM Sithole reacted bitterly to this course of action:

*'Rumours have it that these weirs (of upstream furrow irrigators, AB) have been rebuilt after the people approached Bishop Dube (local MP) through the District Administrator. Also that the payment of maintenance fees was illegal. (...) Irrigators (in Nyanyadzi scheme, AB) are badly worried about the water shortage. May I suggest that the top officials should make a decision whether to have the existing scheme or legalise the 80 hectares along the Nyanyadzi river.'*⁹

More upstream raids were organised by Agritex IMs of Nyanyadzi irrigation scheme in 1987, 1988, 1991 and 1994. These raids invariably resulted in the IM being faced with disciplinary action and virtually no improvement of water supply to the scheme (see chapter 9).

In May 1987, the manager directed his attention at illegal garden cultivation along the main canal in Block C. These gardens had been taken up by relatives of the kraalhead and other plot holders, and were the cause of a major siltation problem in the main canal.⁹ The gardens

⁹ The kraalhead, Nyanhanda, also happened to be a former district councillor, ZANU(PF) party member, and one time IMC member. He legitimised his actions by using both a traditionalist idiom (kraalheads being allowed to issue out land) and a party idiom (we fought for freedom, i.e. free water and land use). A case study is presented in 8.1.

Box 6.2: Narrative of the first generation of African irrigation managers^v

Immediately after independence a number of white Irrigation Managers resigned, leaving their posts to resident African irrigation supervisors employed by Devag. These supervisors were promoted to the rank of Irrigation Manager with commensurate wage scales under Derude (1981-87). In 1992 they were demoted again to the rank of supervisor as a result of the on-going professionalisation of Agritex. The first cohorts of officers trained in irrigation engineering took over as irrigation managers (see Chidenga 2003). The first four African irrigation managers were senior practitioners with extensive hands-on experience in African irrigation. Sithole, irrigation manager at Nyanyadzi (1980-91), was born in Mutema, where he witnessed the construction of first government irrigation scheme by Alvord in 1932. The proceeds of irrigated agriculture allowed Sithole's father to send him to the school of agriculture in 1950, which was run at Chikore mission by Alvord himself after his retirement. Sithole subsequently became agricultural demonstrator in Nyachowa irrigation scheme and was promoted the post of irrigation supervisor in 1978, first at Nyamaropa, then at Nyanyadzi. Mudyanembwa was born at Chikore mission station and raised in Chibuwe irrigation scheme. He trained as an agricultural demonstrator at Domboshawa and was deployed in Buhera where he worked in the small Murambinda irrigation scheme (1967-72). Thereafter he worked at Deure irrigation, where he was promoted to supervisor rank in 1980. Later he became the irrigation supervisor at Nyanyadzi (1992-96).

Both men identified with the modernisation ideals of Alvord, being themselves products of the upward mobility facilitated by irrigated agriculture. They spoke highly of Alvord and the wealth, food security and education opportunities that irrigation had brought to the famine-prone Save valley. Sithole:

'Before the scheme that place was full of hunger. There was a lot of carrying. Salt, dried fish and dried meat were exchanged with grains from the highveld. And in the worst years one would even sell the boy, the child boy. You dress it in a girl's clothes pretending to be a girl so that you would be given a basket of grain, so that you could feed your family. That actually happened in my family. Later they would discover they had been given a boy and that would be talked over by the Ishe (Chiefs), and you would say: well what could I do? So because of the irrigation that hunger was wiped out.'

Both were committed to firm supervisory control over the plot holders and the beneficial effects produced by it. The issue of user management was viewed with scepticism. According to Mudyanembwa the kraalhead committees had been used as levers by the white irrigation managers:

'They (kraalheads) were told what to tell their people. It was a weapon to say, if the kraalheads say "We are going to do this. This is what Ishe (chief) is telling us to do." Then people go like that (...) With the IMC it was different. They were like a go-between, between the farmers and Agritex (...) But it was the manager there enforcing things to be done.'

To get the IMC to 'enforce things to be done' that had been decided by the irrigation manager, you had to first carefully select and groom 'the right type' of committee members. Next, the trick was to make sure every management decision was agreed upon during public meetings. Minutes played a pivotal role in correcting any aberrant behaviour of individual plot holders. Such plot holders would be called in to the next meeting to account for their deviance. Mudyanembwa explained how this worked:

'You will be all by yourself before the committee and before the manager and explain why you chose to do a different thing than the others. Then we could have some minutes taken and read them, go through them. Whether that man was right or not. Then we still come back and say "Right, this thing should not be done."'

The legacy of the war complicated the work of the irrigation managers. Mudyanembwa recalled a visit from the Minister of Agriculture in 1983:

'The Minister came to say "Right, I'm told here that managers are refusing people to do this and that. We fought for this one, wherever water can be used, you can use the water". (...) It is because now it was after the struggle and everyone got his say. And he can say what he likes. What he is doing at his home, he can do it at the land. And yet an irrigation scheme is a confined thing, which is delicate to diseases if mis-managed.'

were set ablaze and destroyed.^{vi} During a general meeting organised by the IMC on 10 June 1987, the IM was taken to task for his actions. The IMC chairman asked those who did not pay maintenance fees to leave the scheme. The kraalhead for block C then threatened to call the Minister or even the prime Minister to effect exemption from payment. When the issue of the burning of illegal gardens came up, a police officer remarked that the police was loyal to the ruling party ZANU(PF). He deplored the burning of the gardens. People who were using these gardens could come forward to be granted the right to continue using water to irrigate their gardens.^{vii} Once more the manager had been over-ruled by party directives. The acting provincial agricultural officer approached the provincial party leadership to find out what their position was on the 'payment of maintenance fees throughout the schemes, particularly those with large sums still outstanding'.^{viii} However, he and the rest of his staff remained without clear directions from the Party.

Over time the plot holders in block C, under the vigorous leadership of their kraalhead, started to claim heritage over their part of the water-network. Most of the block C plot holders were descendants from original inhabitants that had been enrolled in Alvord's first irrigation furrow. Keenly exploiting their ancestral claim of ownership, physical location along the main canal, and promises of free water by the political paymasters of the day, block C plot holders diverted water that was meant to flow into the night storage dam, to their own plots at night. Manager Sithole mounted several nightly inspections in the block to curb this practice of water stealing, but found himself virtually powerless, since the fines he imposed on the water thieves were not paid.^{ix}

Nyanyadzi irrigators kept on defaulting on their maintenance fee payment.¹⁰ When in April 1989 a new IMC was elected consisting exclusively of defaulting plot holders chaired by the block C kraalhead, the Provincial Agricultural Extension Officer (PAEO) for Manicaland decided to act. He personally visited Nyanyadzi to welcome the new IMC and explain them their duties. According to him, these amounted to nothing less than (1) maintaining discipline among plot holders; and (2) encouraging payment of maintenance fees: 'The committee is meant to assist and never to replace Agritex'. He also announced his remedy for the deplorable situation in Nyanyadzi:

'Maintenance fees to be paid in full before June 30. All plot holders who have paid in full will be issued with the relevant permits. All defaulters will be given a chance to pay before 31st of August. After that date defaulters will be issued with eviction notices showing Government's intention to act.'

The PAEO then checked the credentials of the new IMC members, since they had to be 'exemplary to their followers'. He found all members owed money to the Government. He requested them to pay before June 30 or else they be forced to resign: 'The committee would be dissolved on the grounds of indebtedness'.^x After the PAEO had finished his speech he was told by the IMC to go home and never visit them again.^{xi}

Rather than leaving it at that, the PAEO mounted a province wide irrigation inspection (the so-called 'physical exercise'). Plot holders were requested to wait at the edge of their plot on the announced day of inspection with their identity papers and receipts of maintenance fee payments at hand. Those guilty of offences like arrears in payment, sub-division of plots amongst offspring, lease of plots or cultivation of illegal gardens, were to be served with eviction orders on the spot. During a meeting of all irrigation officers at Agritex provincial headquarters on 11 July 1989, progress of the exercise was discussed. It was noted that

¹⁰ Nyanyadzi scheme had the highest amount of outstanding arrears of all schemes (Z\$202,521).

discipline had been restored and a surge in payments had occurred in most schemes, except in Nyanyadzi, where 'comparatively the disorder (...) is extreme.' The minutes note:

'This (resurgence) is viewed as an attempt to bluff off eviction orders which are looming over them. Even with an extension of two or so months some groups at Nyanyadzi, Chakohwa, Devure and Nyamaropa will never beat the count. It was generally agreed that an extension of the dealings will only yield higher debts. Action in form of either eviction (forcefully) or withholding water was called for, despite the mass movements from the plots that would ensue. Co-operation with district councils, governor, Provincial Administrator would be vital in this exercise to avoid back-firing on Agritex face if it carries out the task lonely. The PAEO is expected to chip in on this one, if possible, urgently'^{xii}

Regarding the signing of the three permits, it was noted that in Nyanyadzi 'even those farmers who have paid up are refusing to sign and accept their permits – strange.' To Nyanyadzi plot holders the refusal to sign may not have been so strange. They did the same in 1968 (see 5.3).

The worst was yet to come. Whilst the 'physical exercise' went well in all other smallholder irrigation schemes in the province,

'at Nyanyadzi the committee and farmers refused the physical exercise (...) The farmers were influenced by the committee (...) They uttered bad words against government. That the physical exercise is not government policy. That they are not going to vote in favour of the government in the coming election. That the whole thing is being done by the PAEO and the IM. The whole staff must be removed from the scheme and remain communal. That they will make a follow up to the President. That they have declared war with the oppressors, etc.'^{xiii}

The PAEO replied by sending eviction orders for all registered defaulters in Nyanyadzi. The director of Agritex, visiting Nyanyadzi in an attempt to pacify relations, was told to go home by Nyanyadzi plot holders. Meanwhile the IMC sent delegations to the provincial chairman of ZANU(PF) and the president's office. The ZANU(PF) politicians in the end instructed the director of Agritex to cool down on operations in Nyanyadzi and the PAEO was forced to repeal his actions.^{xiv} The ruling party was eager not to lose support in an area that was known to be under the influence of two opposition parties.¹¹ The move frustrated the PAEO, resulting in a disinterest in Nyanyadzi irrigation scheme. His personal stance on the turnover issue towards his staff was to stress that irrigation farmers first and foremost had to prove they could foot the bills. After that, one could start thinking of necessary rehabilitation of the schemes and training needs for IMC members.^{xv}

During the ensuing years, the IMC became an active farmer body trying to solve the scheme's problems by approaching the relevant political authorities, whilst side-lining Agritex. During the dry 1990/91 season, the IMC, after pressing Agritex during several meetings to waive payment of maintenance fees on account of water shortages^{xvi}, invited the Minister of Agriculture and Governor to discuss: (1) hand-over of Nyanyadzi irrigation scheme to the farmers; (2) exemption of maintenance fees; (3) construction of a new pumping station to replace the failing old diesel engines.^{xvii} By mobilising ZANU(PF) party channels, the IMC on behalf of the plot holders managed to stir their local ZANU(PF) MP into action. The MP and district party leadership repeatedly put pressure on Agritex to waive payment of maintenance fees and speed up construction of the new electrical pump station on the Odzi river.^{xviii}

¹¹ Many people in Nyanyadzi voted ZANU-NDONGA, the opposition party led by Ndabaningi Sithole. The Zimbabwe Unity Movement (ZUM) party led by former ZANU(PF) secretary general Edgar Tekere also had a large following in Nyanyadzi during the run up to the 1990 general elections.

The final attempt at government control by a new Irrigation Officer (1993-95)

In early 1993 a freshly trained Agricultural Extension Officer (Irrigation, hereafter referred to as irrigation officer) arrived at Nyanyadzi irrigation scheme. His first actions entailed a search for a class A evaporation pan (required for 'scientific' irrigation scheduling) and a request to the provincial office asking for the official policy with regard to irrigation management. Both were non-existent, as transpired from the reply from the provincial office:

'there is no gazetted policy (...) However there is quite substantial written work classified as Policy papers. These seem to be proposals more than anything else. They are very valuable and operative in most cases. If anything else they need updating and formal Endorsement as Policy. (...) In conclusion it can be observed that there is no policy (...) Although the dominant figure (in management, AB) should be the Irrigation Committees, there is a marked degree of paternalism by Government departments and Donor Agencies.'^{xx}

Subsequently, the new irrigation officer decided to draft his own policy together with his Nyanyadzi office staff during two separate meetings. The old line of command was from the irrigation officer to the agricultural supervisor to his four subordinate extension workers (one for each block) to the six water controllers down to the general hands. Farmers were organised in the IMC and in Block IMCs. However, the extension staff noted that discipline amongst farmers had gone down since the war: 'Staff said they cannot use the stick method, which was used by the whites because the Irrigation Manager has no support from the top officials.' The new officer instructed his extension workers to work closely with the Block IMCs: farmers would no longer be allowed to visit the office unless they had clearance from their extension worker. In order to curb indisciplinary behaviour by Block IMCs it was suggested to select 'workable farmers' and 'manageable committee members'. It was also decided to 'prevent the IMC to talk straight to Provincial Chefs¹²', because that was disrespectful to local Agritex staff. Furthermore it was noted that the IMC did not enforce byelaws itself, but rather sent the water bailiff, without providing proper backing. The irrigation officer therefore decided the extension worker would be responsible for the follow-up.^{xx} In October 1993, the officer disciplined the kraalhead and IMC member for block C. He was called into the local Agritex office and told to stop issuing out more land along the main canal and to stop instigating block C plot holders not to pay maintenance fees.^{xxi}

However, this effort at regaining control over the scheme was short-lived. One factor in particular compromised the position of Agritex. Since the adoption of an Economic Structural Adjustment Programme in 1991, the public service faced severe budget cuts, resulting in dwindling financial allocations for operational activities like canal maintenance. Many government posts were abolished and early retirement packages issued to redundant staff. As a result the Agritex Nyanyadzi office had less general hands at its disposal to desilt the pump sump of the new pumping station and clean the main canal. In February 1994 both sources of water for Nyanyadzi irrigation scheme (Odzi pump station and Nyanyadzi main canal) were blocked with silt. The new irrigation officer decided to stick to his own responsibilities and directed his general hands at cleaning the blocked main canal from Nyanyadzi river.¹³ This decision produced fatal results. Block A, B and D, relying heavily on Odzi river supplies, were only reconnected to irrigation water after three weeks. The standing maize crop had wilted due to water stress. On 11 March 1994 a general meeting was held, where the District Administrator (DA) was asked to mediate between the angry plot holders and Agritex office.

¹² The word *chef*, as used in Zimbabwe, signifies somebody of great importance. Superiors or politicians are popularly addressed as *chefs*.

¹³ Officially the DWD was responsible for cleaning the pump house, but on account of a lack of personnel they had relied on Agritex maintenance staff in the past.

The new irrigation officer was publicly scolded by plot holders for not taking the farmers' interest at heart.¹⁴ The IMC was blamed for not taking action sooner. The DA observed that there had been a breakdown in communication lines. It was resolved that in future Agritex would keep in touch with the DWD Provincial head quarters and inform the IMC in turn. The IMC would be tasked with calling emergency meetings with farmers to address any problems at hand.

Water management in Nyanyadzi on the eve of a dry season

Workshop on irrigation management for Agritex staff

In September 1994 a workshop on irrigation management was organised for all Agritex extension workers and supervisors that operated in smallholder irrigation in Manicaland province. The workshop lasted for five days and consisted mainly of lectures from senior Agritex staff that rehearsed the basic principles of the 1983 Derude policy as well as a field trip. The workshop was opened by the deputy director engineering (heading the Agritex irrigation division), who happened to be visiting irrigation schemes in Manicaland in connection with a consultancy assignment that entailed the formulation of a national irrigation policy. During his presentation he emphasised the need to go for commercial production in irrigation schemes. He also revealed that the government intended to raise the national blend price for water and devolve costs for operation and maintenance of the schemes to the plot holders, citing the latter as a worldwide trend.

During a coffee break, some researchers asked the deputy director on the validity of a document that contained the control of irrigable areas regulations, dated 1982, which was similar in content to its 1970 predecessor.¹⁵ The director related that since the document had never been gazetted, it was not valid. The implication was that plot holders could contest eviction orders based on, e.g. non-payment of maintenance fees, in the civil courts. To this the deputy director replied: 'Yes, but the farmers are not like you people. They won't go to court.'

After the break the Derude policy defining conditions governing the use and occupation of irrigated land were read out aloud to lecture the class on the irrigation management policy in force. When one of the researchers raised the matter of their contested legality, fierce debate broke out among the attending supervisors. It transpired only one of them actually enforced the annual permits and used them to evict plot holders that did not plant recommended crops, sub-divided their plot, or did not fulfill their duty to conserve the land. Others claimed they had no authority to evict plot holders: traditional leaders and council officials could do so, but not Agritex. The facilitating DAEO sealed the debate by stressing the need for managerial order, invoking a biblical metaphor:

'When Moses left for this hill, many people thought he would never come back. They started doing all sorts of things. But then he came back and there was order.'

In general the issue of handing over management to the plot holders was treated with scepticism, since most of the workshop attendants did not believe the plot holders were capable of generating the funds required to operate and maintain their schemes.

¹⁴ The officer had already received an anonymous letter from Nyanyadzi farmers asking for his removal from the scheme. Later some women stripped naked in front of the officer singing that they would make a coffin for him. Agritex Chimanimani district files, Report on Nyanyadzi staff meeting, 28 July 1994.

¹⁵ The regulations contained the legal basis on which the three annually renewable permits to reside, cultivate and destock in irrigated areas could be issued or revoked.

During the field trip to Mutema irrigation scheme, the resident supervisor proudly showed his system of scientific water management. Based on daily readings from a class A evaporation pan and a rain gauge, he calculated daily crop water requirements and directed water to needy plot holders. To facilitate water control and prevent the spread of crop diseases, plot holders had been forced to grow the same crop simultaneously in each block (the so-called block system, see Manzungu 1996). Whilst most supervisors and extension workers praised the Mutema supervisor for his 'technical' skills, it was noted that the adoption of the block system across all smallholder schemes was seriously hampered by a lack of water measuring devices.

Nyanyadzi scheme on the eve of a dry season

Whilst the management at Nyanyadzi faced an uphill task in aligning the plot holders according to the duties assigned to them, water once more proved the most obstinate (f)actor influencing the performance of the water-network.

At independence the experiment farm had been closed and the plots issued to new irrigators, expanding the scheme to a total command area of 414 hectares. The canal network had been upgraded in 1983-84 (lining, redirection of canals), though the canals servicing blocks B and D were inaccurately levelled resulting in insufficient canal capacity to supply the blocks. Studies in the mid-1980s revealed that in most years the combined water supply from the Odzi and Nyanyadzi river was insufficient to meet crop water requirements during the winter season, or even meet the water allocation contained in the water right (Pearce and Armstrong 1990, 11-19). Frequent pump breakdowns meant the scheme mainly relied on Nyanyadzi river, which failed to deliver sufficient water in 50% of the winter seasons (i.e. in 1983, 1984, 1987, 1990, 1991, 1992, see graph 9.1).

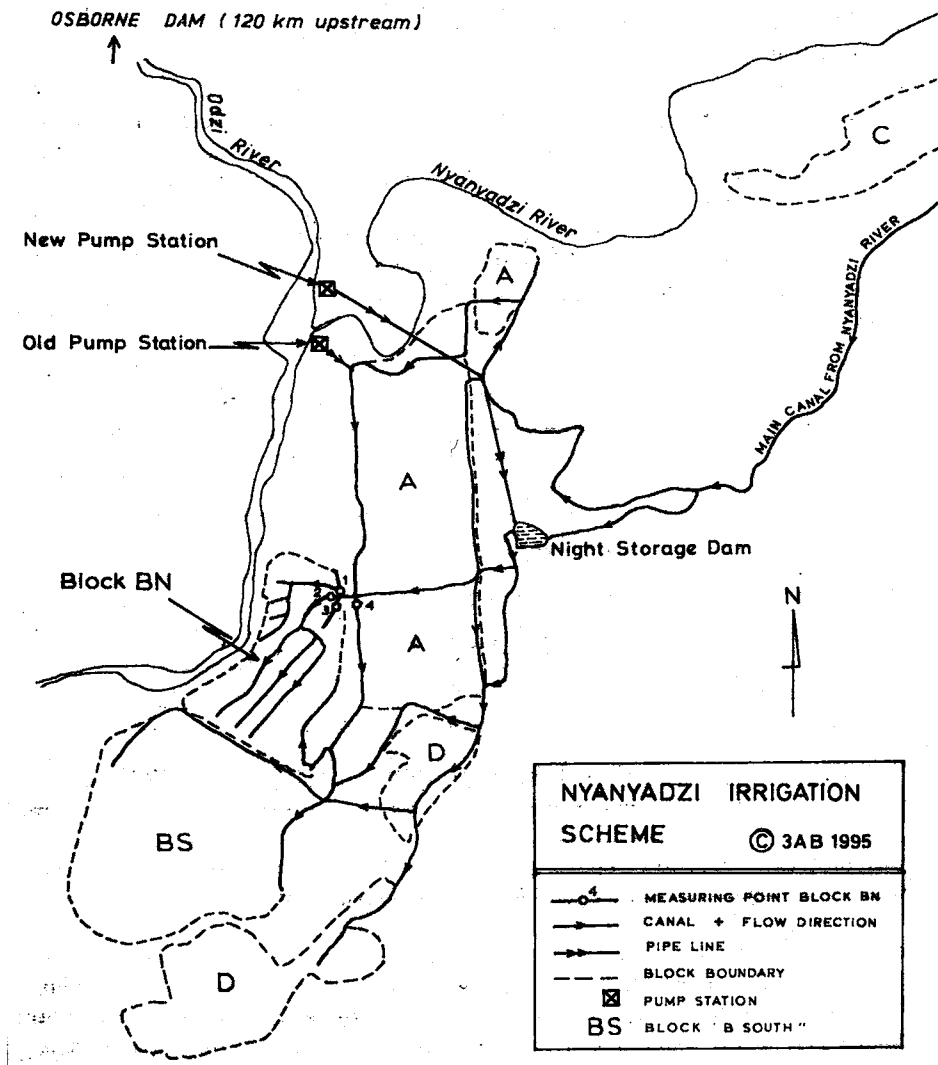
Even during ample rainfall years certain characteristics of flowing water precluded smooth management. Seepage losses in the main canal ranged from 25 to 50% (Pearce and Armstrong 1990, 19) and increased silt loads contained in the water resulted in frequent siltation of the intake weir, main canal and night storage dam. Meanwhile flash floods originating from surrounding dry land resulted in frequent canal blockages, ongoing siltation and occasional washing away of plots. To scoop the sand and reclaim the growing gullies affecting blocks A, B and C, the management relied on dozers and expert advice from district and provincial offices. Yet often the finances to undertake such works was not forthcoming and government interventions trying to reclaim gullies were ineffective. Despite frequent calls for more government resources to line the main canal; provide scouring gates in the weir as well as silt traps; and build dry dams and gabion walls to stop the growth of gullies,¹⁶ by 1995 the main canal was transected by 13 gullies in block C. In addition two major gullies had developed in blocks A and B that threatened to eat away the edges of these blocks. It was hoped that the new Odzi pump station, combined with the construction of the large Osborne dam some 120 km north of Nyanyadzi, would solve the scheme's water woes (map 6.1).

Day-to-day water management in the scheme was done by six water bailiffs (see Photo 10), who met with the IM every morning at 6 am. After receiving instructions, the water bailiffs would deploy in their respective blocks to set the gates and distribute the water among needy plot holders. The resident Agritex staff, weary of a lack of political and financial support to

¹⁶ In August 1986, a concerted effort to reclaim the gullies in the block C area was disapproved by provincial Agritex staff on account of the mis-behaviour of the block C councillor *cum* kraalhead.

set things right in the scheme, had 'retired' to their offices.¹⁷ They devoted most of their time to filling in crop sheets and other requests for information on the scheme from a variety of sources.¹⁸ They only confronted the plot holders during crop meetings, field days, and management meetings organised by the IMC.

Map 6.1: Nyanyadzi irrigation scheme, 1995



¹⁷ During my first year in the scheme as a researcher I was often accompanied in the field by a young extension worker who had recently been posted to Nyanyadzi. At some stage a plot holder commented to me that since the extension worker was new, he still came to the field. He also predicted that as soon as the novelty of the situation had worn off, the extension worker would 'retire to his office, like the other ones.'

¹⁸ During the early 1990s, extension workers had to fill in the farming details of every plot in their block for at least three different sources: the central statistical office, Agritex monthly reports, and for consultants and Agritex staff that had embarked on academic studies.

6.3 WATER SCARCITY MANAGEMENT IN WINTER 1995

In March 1995 it became clear that the much hoped for rainy season of plenty had not come. By March 16 the Nyanyadzi river had already completely dried up (see Photo 11). The situation in the government dams did not promise much relieve: Osborne dam was only 7.5% full by the end of February. The provincial water engineer in Mutare had not yet decided how to distribute the little available water amongst the many smallholder irrigation schemes in the Save valley. However, sometime in March he decided to allocate the water for the winter season to Nyanyadzi irrigation scheme and communicated his decision to the irrigation specialist at the Provincial Agritex office. The Nyanyadzi office only much later found out about this decision. Meanwhile most farmers in Nyanyadzi were watering their maize crop for the final time. The new Odzi pumps were regularly down, because of a lack of water in the river (see graph 6.1). This instilled a sense of the precarious situation amongst the Nyanyadzi people. Below a month by month account of the season is given.

March: the onset of a dry winter season

On behalf of the Nyanyadzi irrigators, the IMC had entered a contract with a small firm, called Agri-Seeds, for growing 250 hectares of beans in the forthcoming winter season.¹⁹ A list had been prepared of all farmers intending to grow beans. The contract raised the hopes of the irrigators. The annual bean crop is the big cash earner to pay for school fees. The negotiated price of Z\$5 per kg of beans was the same as the year before. Block C irrigators had not been included in the deal. Since the Nyanyadzi river carried no water, their winter season was over before it had even started. The irrigation manager decided to cut on the irrigable acreage. In a meeting with all water bailiffs and the IMC it was decided to allow each plot holder one irrigated acre only. This would spread the scarcity equitably over all plot holders. The measure became known as the 'one acre rule'. It was to be communicated and implemented by the water bailiffs in conjunction with the IMC.

The pumps

During an Agritex - IMC meeting on March, 30, the situation at the pump house was discussed. The irrigation manager complained that the pumps failed to pump for 24 hours, as they did before. After consultation with the local DWD representative, it transpired that the pumps broke down too frequently to allow for pumping round the clock. Furthermore it proved difficult to draw sufficient water to the pump house. Since Agritex could no longer provide sufficient general hands to work on the pumps, cooperation from the plot holders was requested. The IMC chairman was of a different opinion and declined to help. One of the extension workers pointed at the communication problems Agritex experienced with the DWD. Their work was constrained by having to follow the proper channels, which went all the way up to the Chief Extension Officer in Mutare and then from the provincial water engineer down the line of command within the DWD. He also felt the pumps were not Agritex' responsibility, so they could not be blamed. Another extension worker urged the IMC to take action themselves and pay a visit to the DWD office in Mutare. According to him:

'DWD has always been troublesome, also in the time of the diesel engines (old pump house). We have met over and over again. In March 1994 they promised to solve the issue, but up till now they have done nothing.'

¹⁹ The Nyanyadzi Co-operative Society, previously responsible for negotiating crop contracts, had demised in the late 1980s due to severe financial problems. These problems had in part been caused by plot holders who failed to repay their loans on account of drought induced crop failures.

In the end the IMC agreed to pay a visit to Mutare to find out about the situation of the pumps.

Box 6.3: Comparison of two water scarce seasons in Nyanyadzi (1968 and 1995)

In March 1968 a special emergency meeting was held in the District Commissioner's office. Attending were the DC, the irrigation manager and representatives of Conex, DWD and Rhodesia Seeds limited. This all white ensemble observed that for the winter crop only water from the Odzi pumps could be relied on, enough to irrigate circa 30 ha in block A and 58 ha in block B. To avoid unnecessary losses water would be concentrated in two areas within the blocks, whereby plot holders would be given the option to grow either cash or food crops. In the case of cash crops under contracts of Rhodesia Seeds, rigid conditions would be relaxed. After the meeting the attendants went on an inspection tour through the scheme and discussed the proposals with the kraalhead committee, that insisted that unfortunate plot holders (outside the demarcated areas for irrigation) should be permitted to cultivate part of the land of fortunate plot holders. Furthermore they demanded a remittance of water rates for those who were unable to irrigate (a remittance of 50% was granted). The kraalheads informed the irrigation manager which people would undertake winter irrigation and what crops they wished to grow.^{xxii}

The comparison with winter 1995 yields a number of observations. First, it can be noted that the (water) situation in 1995 was not fundamentally different from the one in 1968. In both cases management was facing a water shortage. They knew beforehand that something had to be done to deal with the anticipated water scarcity. In both cases farmers' representatives were consulted. However, in 1968 the crop planning was based on estimates of the available water supply. In 1995 water scarcity measures were not based on available water supply, but on an acreage cutting measure (the one-acre rule). Furthermore the proposed water rotation schedule in 1995 was not based on information that was at hand, i.e. the list of plot holders that intended to grow beans and the command areas of the irrigation blocks. It was a trial and error decision. Striking is also that in both meetings the most knowledgeable actors on the subject (the water bailiffs) were not consulted. Furthermore, the 1968 meeting crosscut administrative boundaries. The DWD, scheme management, seed house and top administrators were all involved in the decision making process. In 1995 that was no longer the case: administrative boundaries proved impenetrable and time-consuming procedures were rife. To facilitate a short cut of the circuit local Agritex staff sent the IMC to Mutare to find out what the Provincial Water Engineer had in mind.

The new water rotation schedule

During that same meeting another cunning plan of the irrigation manager was launched.²⁰ As a water saving measure it was suggested to pump straight into the canal network instead of storing water first in the night storage dam (NSD). This implied that people could irrigate as long as the pumps were working. In addition the water would be concentrated in one block at a time, instead of all blocks at the same time. In the old system irrigation took only place from 6 a.m. till about 1 p.m. when the NSD was empty (see table 6.1). Pumping would then proceed to fill the NSD. The new system would be evaluated after one week to see whether it would save water. One extension worker was convinced that the system would prove a success. Another doubted whether water would reach the outer corners of the scheme, since the pressure of water stored in the NSD would fall away. Another fear was that when water was supplied to block D for one week and the next week a pump breakdown occurred, block B-South (BS) would be deprived. It was proposed to have three days per block. Then it

²⁰ Here it must be noted that the author played a role too. I had suggested that water could be saved by pumping water straight into the canal network, instead of first storing it in the night storage dam. The Night Storage Dam (NSD) was leaking badly. Besides, under the old water distribution system the water entered the network in several canals at the same time, precipitating high seepage losses. These losses could be reduced by concentrating the available water flow in one canal at a time.

transpired that not all blocks had the same size. The first extension worker wondered how many outlets each block contained. Since this was not known it was decided to give each block two days and just give it a try. The block D extension agent proposed to count the number of planted acres. But this suggestion was overruled. The irrigation manager aired his conviction that it would work out nicely and started jotting the dates and blocks to be irrigated, as from April 1 onwards. The final schedule comprised 2 days for block BS, Sunday no irrigation, 2 days BN, 2 days D and 2 days A. A comparison of the winter 1995 water scarcity measures with those taken by the scheme's management in winter 1968 is given in box 6.3

Table 6.1: Old and new water rotation schedule

Old system						
Day	Blocks					
Sunday	Pump into the NSD, no irrigation					
Monday	A, B and D from NSD 6 a.m. to 2 p.m.					
Tuesday	A North straight from pumps 6 a.m. to 2 p.m. A, B and D from NSD 6 a.m. to 1 p.m.					
Wednesday	A, B and D from NSD 6 a.m. to 2 p.m.					
Thursday	A, B and D from NSD 6 a.m. to 2 p.m.					
Friday	A, B and D from NSD 6 a.m. to 2 p.m.					
Saturday	A North straight from pumps 6 a.m. to 2 p.m.					
New system						
Rotation	Days per block				Duration of rota (days)	Period in operation
	BS	BN	D	A		
1	3	2	2	3	10	beginning of April
2	2	2	2	3	9	mid April - mid May
3	2	1	2	2	7	mid May - begin June
4	2	1	2	3	8	begin June - mid June
5	3	1	3	3	10	end of June
6	3	1	2	3	9	July - mid August

Source: Agritex and own measurements.

Note: In the old system the main gate at the Night Storage Dam (NSD) was closed after 2 p.m., leaving the pumps to fill it.

April: the new rotation schedule

In April most people had harvested their maize crop and were planting beans and tomatoes, as soon as they received their first irrigation turn. With the seed readily available, most of the irrigators planted their beans before May, as recommended by Agritex. By the end of March Agritex deployed a grader to re-construct the feeder dam that directed water from the Odzi river to the pump house. Thus the pump operator could start the engines in time, in stead of waiting for the Agritex general hands to first repair the feeder dam. However, from 17 to 24 April the pumps were down again on account of a lack of water in Odzi river. The IMC at the instigation of Agritex staff visited the District Administrator in Chimanimani on April, 23. They informed him of the water scarcity in Nyanyadzi and asked for his assistance. The DA immediately phoned the Provincial Water Engineer, who stated that there was nothing to worry about: the little water that was left in Osborne dam was earmarked for Nyanyadzi. The IMC duly informed the general public.

Evaluation of the new water rotation schedule

The main question in the minds of management was whether the new water rotation schedule had improved the water situation in the blocks. The initial signs were positive. Water bailiffs reported an increase in acres irrigated per day compared with the old system. The initial flat rotation of two days per block was changed at the suggestion of the water bailiffs; the relatively large blocks BS and A received one day extra. Canals did not over flow nor was water pressure lacking. The IMC was enthusiastic. It was decided to proceed with the new system.

To evaluate the effects of the new system on the water distribution data are presented for blocks B-South (BS) and B-North (BN). The comparison focuses on the number of acres irrigated under each of the two systems. In the old system (see table 6.1) water used to flow into block B during six (fixed) days of the week for about 8 hours a day.²¹ According to the bailiff records of Block BN, for March 1995, the old system irrigated on average 1.08 hectares a day, or 5.4 hectares per week. The new water schedules were re-shuffled several times during the winter 1995 season. The various rotation schedules that were tried during the season each show higher weekly averages varying from 6.1 hectares in the worst schedule for BN up to 13.5 hectares in the most favourable schedule. So definitely for block BN the new system was an improvement. In block BS the old system supplied water during five fixed days per week, irrigating 1.6 hectares per day, 8.1 hectares per week. Again the six schedules that were tried in the new system show higher weekly averages varying from 10.7 to 16 hectares.

Table 6.2: Share of command area compared with time-share of water schedules, winter 1995

Block	Area (ha)	share %	rot 1 %	rot 2 %	rot 3 %	rot 4 %	rot 5 %	rot 6 %
A	136.6	39	30	33	28.5	37.5	30	33
B	143.6	41	50	45	43	37.5	40	45
D	69	20	20	22	28.5	25	30	22
Total	349.2	100	100	100	100	100	100	100

Source: own observations

But how did block B fare compared to the other blocks? Table 6.2 compares the command area of each block with the time-share it received under each of the six consecutive schedules. In general block B fared well, receiving more water than it could claim on the basis of its acreage. Still, even in the case where it got less than its equal share of the water (schedules 4 and 5), the irrigated acreage was higher under the new than under the old system.

Another feature of the new water rotation schedule was the continuous re-shuffle in the number of days each block was supposed to receive water. This was a result of the ongoing negotiation process between the plot holders, water bailiffs and Agritex staff. These negotiations took mostly place during public events, such as emergency meetings, field days, and IMC meetings. The bailiffs had been the prime actors in adjusting the first crude schedule, tuning the time-shares to the actual sizes of the blocks. The subsequent rotation schedules were a result of pleas that claimed a bad deal for a particular block that needed to be corrected. These pleas were made by both extension workers, advocating the block they were responsible for, and groups of plot holders. A rather definite change to grant block BN

²¹ Of the six days, four were used to irrigate block BN and BS simultaneously, whilst two days were used to concentrate water in BN and BS respectively.

only one day of water was enforced after observing on May 17 that irrigators in block BN had grossly violated the one acre rule. The daily working routine of the bailiffs in the scheme was fundamentally changed by the new system of water rotations. Whereas in the old system every plot holder knew the day water would come, the new system combined with regular breakdowns of the pumps did not guarantee any security of water turns. As a result bailiffs were continuously harassed by plot holders who wanted to know when their block would receive water.

May: failure of the one acre rule

By May 1995 every plot holder in the scheme was fighting to get his/her acre(s) watered for the first or second time. The pump house was shut down for ten days (8-16 May) due to repairs on the main outlet valves of Osborne dam. The dry spell triggered another meeting between Agritex staff and the IMC on May, 17.

The meeting between Agritex and the IMC revolved around problems with the implementation of the one-acre rule. Several IMC members indicated that the water bailiffs had tampered with the implementation of the one-acre rule resulting in some people irrigating four acres and others none. The IMC chairman stressed that Agritex should have made a 'follow-up' of the one-acre rule. He claimed he could do nothing without backing from the officials. The extension worker for block A rebuked the IMC for not controlling its members. To underline her analysis she cited a letter from the chairman of the block A IMC calling for a general meeting to discuss the lack of communication between plot holders, IMC and Agritex. This infuriated the IMC members who insisted the letter should be dismissed, because the author had by-passed the existing line of command. There was a general consensus that the situation had to be re-dressed. A new water rotation schedule was agreed upon, in which block BN on account of its small size would receive only one day of water, instead of two. In spite of the risk of serious crop losses in block BN, the IMC found it important to stand firm on the one-acre rule. A discussion ensued on who the actual plot holders were. Agritex stressed it would stick to the official list of plot holders. When a participant observed that some plot holders on the list had passed away, the plot having been sub-divided amongst the heirs, the extension worker said Agritex could only stick to the official list. If someone had died, the heirs should have reported to the office for re-registration. She failed to mention, however, that most irrigators refrained from doing that, because re-registration involved payment of outstanding arrears in maintenance fees of the deceased. It was agreed to call a general meeting to inform the people of the change in the water schedule.

The general meeting one week later was marred by accusations and counter-accusations of different plot holders over alleged water stealing by Block A irrigators and violators of the one acre rule. Some denounced the IMC and called for new elections. The records of the bailiff for block BN show that out of the eighty registered plot holders, ten had been irrigating more than one acre (the so-called violators of the one-acre rule), whereas nine plot holders had irrigated none of their land, sometimes on account of a lack of labour. Striking is that after 16 June the bailiff stopped keeping records. In his own words the situation had become 'too hot', implying that he felt his records could be used as evidence for favouring certain irrigators. By then block BN was in serious trouble: one day of water in each water rotation could not meet the demands created by earlier times of plenty.

In spite of their limited involvement in the management decisions taken by Agritex and the IMC, the bailiffs were the key actors in negotiating the water distribution in the blocks with

the local plot holders. In these daily negotiations the bailiffs had to deal not only with registered plot holders, but also with dry land farmers that hired plots, heirs of deceased plot holders, and labourers that worked on the land for local shop keepers (see 7.3). While Agritex, IMC and plot holders were having their endless meetings and discussions on water schedules and violators, the water bailiffs performed the daily 'dogs work' of water distribution in a different reality. The 'one acre rule' in this world carried a different connotation than in the administrative world of registered plot holders. Experienced bailiffs, like the ones working in block BS, did not register any of their water transactions in the form of records. They felt it was better not to leave traces of their daily acts of translation.

June: keep on re-scheduling

June 1995 was the first month without pump breakdowns. No emergency meetings were organised. The protracted struggle in the blocks went on and so did the re-scheduling of water rotations. Block A plot holders made it clear to Agritex that they preferred the old system of water distribution. Their geographical position (close to the water source) had given them a competitive edge in the old system, which they did not enjoy in the new system of rotations (see Pearce and Armstrong 1990).

Creative ways of demanding a greater share of the water for one's own block were developed. On June, 16, the Agri Seed company organised a field day in Nyanyadzi. The IMC chairman was roaming in block BS (his own block) calling upon people to turn up in big numbers during the beans 'feed day' to make a strong plea for 4 days of water for block B. During one of the entertainment intermezzo's at the field day a local drama group performed a play in which another water schedule was proposed. In the play some local block B and D farmers played themselves and the irrigation manager throwing different schedules at each other. After a fierce argument, one player came up with the ideal schedule (3 days A, 4 days B and 3 days D). Dancing and shouting the number of days, the drama players left the floor. Shortly after concluding the field day festivities the irrigation manager proposed a re-shuffle: 2 days A, 3 days B and 2 days D (easy implementable, 7 days schedule). Kraalhead Dirikwe proposed another schedule: 3 days A, 4 days B and 2 days D. His proposal was met with a thundering applause from the floor.

While different sets of actors were rallying for a change in the schedule, the situation in block BN had become tense. The prolonged vote of only one day in any rotation schedule had produced excessively long irrigation intervals for the block. For beans in natural region 5 a rotation of at most 14 days is recommended, depending on water holding capacity characteristics of the soil.²² Beyond 14 days the crop suffers from moisture stress, resulting in yield reduction. The actual number of days that people had to wait for their second turn of water, after receiving their first (irrigation interval 1), was on average 33.5 days, varying from 14 to 60 days.

Asked for comments on these figures, the irrigation manager and one of the extension workers, were not dissatisfied. Normally they would recommend a maximum of four weeks (28 days) in between turns. The local irrigation officer was shocked to hear of such long intervals. He had learned that 7 to 14 days depending on the soil quality and climatic conditions were the limit. An irrigation specialist at the Provincial office was equally shocked. These reactions clearly show that high ranking staff which has undergone some

²² The Agritex irrigation manual (1994a, 789) mentions an exemplary irrigation schedule for beans irrigation intervals of 4 to 7 days. The Irrigation Officer in Nyanyadzi also referred to this table.

form of training in irrigation scheduling have clearly different ideas of what is acceptable as crop irrigation water requirements than the average extension worker and irrigation supervisor that are managing the schemes on a daily basis. The plot holders in block BN had their own means of evaluating crop water stress. They felt that an interval of two to three weeks was the maximum allowable.

July: Damn the pumps

Despite the continuous hassle with the irrigation schedule, the bean season was now in full swing. A majority of plot holders was either seeking a third turn of water for beans or was harvesting the crop. Some were trying to secure the first irrigation turn for winter wheat. Pumps had been down for the last time on May, 16. Then on July 10 the only remaining pump was stopped on account of rampant leakage. On 15 July, just after starting the engine, the top rod broke and the pump house would remain silent for nearly a month.

History of pumps in Nyanyadzi

The diesel pumps never provided a reliable source of water, due to a lack of spare parts, regular flooding, and problems with the silt load of the Odzi river water (see chapter 5). From 1980 to 1987 only two out of six pumps were operational, dropping to one only after October 1987. A scarcity of foreign exchange precluded the purchase of spare parts.^{xxiii} In the 1980s most (80%) of the water into the scheme was provided by the dwindling Nyanyadzi river flow (Pearce and Armstrong 1990, 19). By the end of the decade all pumps were out of order.²³

A new pump site had been surveyed in 1983 on a high rock formation North of the Nyanyadzi confluence with Odzi.²⁴ Two pipelines would service both the Nyanyadzi night storage dam and the new irrigation scheme in Nenohwe. The construction of the new pump plant took long. Dead lines were not met, funds were not available at the right time and finally when everything was in place by November 1991, it took more than a year before the first testing of the pumps for commissioning was done. The plant consists of four Worthington turbine pumps from the UK. The electrical engines were mounted on top of a shaft with driving rod for the actual suction part that hangs in the pump sump, some five metres lower. The two pumps for Nyanyadzi could not operate simultaneously and had an invariable pump capacity of 400 l/s. During the first test run (February 1993) it was noted that all pumps suffered from overheating and excessive vibrations. A second test resolved the issue of overheating. The excessive vibrations were never fully attended to, causing confusion over whether the pumps were actually commissioned or not. The grace period in a maintenance contract between DWD and the servicing company (Stewards and Lloyds) was set to start on 14 February 1994.^{xxiv}

Operation of the pumps

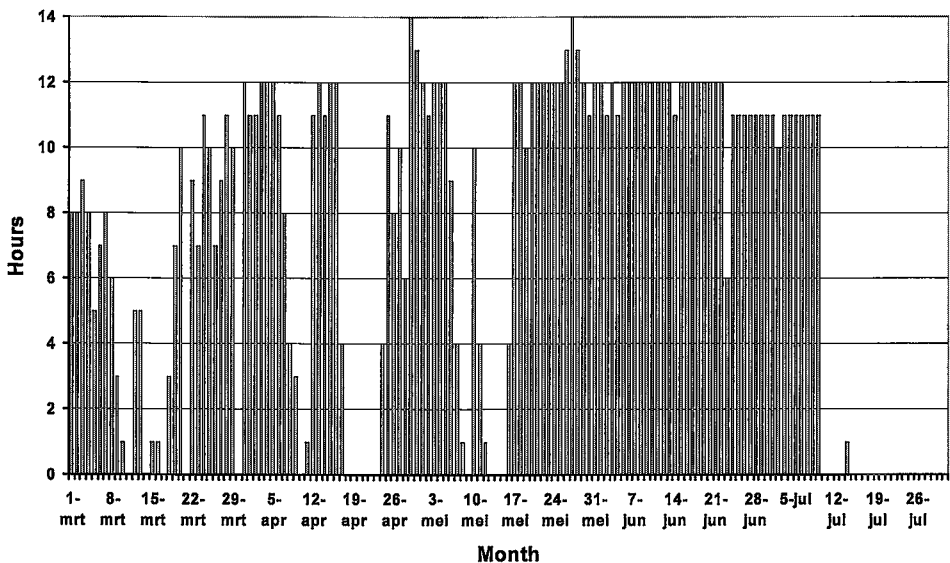
Graph 6.1 provides an overview of the number of hours pumped per day during the winter 1995 season. The pumps were operated for less than four hours a day during 35% of the time. Only during 29.5% of the days the pumps were operated for 12 hours or longer. The actual pump discharge was a meagre 332 l/s instead of the assumed 400 l/s. Both factors resulted in a considerably lower in-flow of water into the scheme than was banked on by the scheme's management. One wonders what caused this problem?

²³ One civil engineer remarked the two old pump stations were 'good examples of constructions made along a river, without the necessary river training constructions and therefore were bound to become failures' (Verhagen 1992, 16).

²⁴ These were the electrified pumps referred to in the regional development plan of 1975 (see 5.3).

The pump shut downs during March, April and May were mainly caused by a lack of water in the river on account of little water being released from Osborne dam or repairs on the main dam valves. In addition, insufficient Agritex general hands were deployed on the reconstruction of the feeder dam in the river that led water to the pump sump. However, the main problem was excessive vibration resulting in heavy leakage caused by worn out threads and bear-rings of the driving rod. The leakage might have led to a loss of suction power resulting in a lower discharge. Because of the leakage the pumps could not be operated for more than 12 hours a day. In the end both pumps broke down and had to be sent to Mutare for re-machining. Pump no.2 broke down on 21 March and was re-installed only by the 8th of August. It broke down again on 18 August. Pump no.1 broke down on July 10. Both pumps were still under repair at the end of the season (October 1995).

Graph 6.1: Daily pump hours at Odzi pump station, 1 March- 31 July 1995



By August 1995, the main actors concerned with the pumps were convinced that there had been a design error. The Provincial Water Engineer had become weary of the pump problems:

'These pumps have become a headache. First we had these problems with silt getting in the pump sump and now we are facing excessive vibrations. I will try to put in a stabiliser, but it were better if a different set of pumps were installed: submersible pumps anchored at the bottom of the pump sump. But now we don't have money for that. I was involved in this design in the beginning (1983). At the time I recommended a pump capacity of 500 l/s. Why we ended up with only 400 l/s, I do not know.'^{xxxv}

A former irrigation specialist for Agritex Manicaland concurred that the type of pumps was wrong:

'It makes no sense to take turbines in a sandy situation like that. At the time (of design) I made a plea to take Golds pumps (submerged). But those were more expensive. The then director did not want it. Well, it was British aid of course. So they chose for British made pumps. You cannot criticize a gift.'^{xxxvi}

Remains the question why it had to take four and a half months to repair a pump. A DWD engineer explained that the maintenance contract DWD had with Stewart and Lloyds contained no penalty clause. So, if Stewart and Lloyds failed to repair the pumps within a certain time, they were not liable for the crop loss. But there were other ways of 'pushing' the work according to the PWE:

'As employer we can delay payments. But in this case, because Stewart and Lloyds has to do the work under the grace period according to DWD, there are no more payments. That is what the wrangle is about. And that is also the reason why Stewart and Lloyds take about a month time or longer to repair that pump.'^{xxvii}

August: Showdown, whom to blame?

The scheme and its crops were heating up. A dry spell lasting for three weeks brought nothing but despair to most plot holders. The scene was set for a dramatic (anti-)climax of the season. The irrigation manager attended a meeting in block B in a last effort to correct old misconceptions. He had prepared his speech very well. After congratulating the block B irrigators with their farming performance and thanking them for paying their maintenance fees, he told his audience that

'the dead may rise, if you believe it. The spirits of the deceased may not be pleased with the behaviour of the heirs. If your deceased father had any outstanding fees he will not be happy. You cannot take only the good things of your father. He paid for your education and made you the person you are now.'

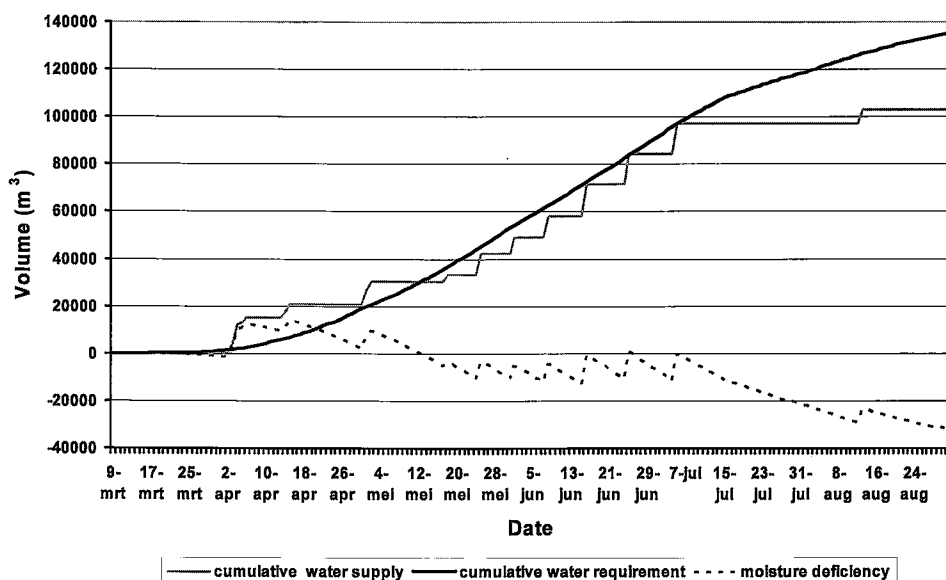
He concluded his speech by observing that Agritex could only work through the list of registered plot holders. Next, he threatened to withhold water from those whose names were not in the register. By extending the theme of the 'dead may rise' the irrigation manager appealed to both Christians and traditionalists. Through the performance of his speech act the manager showed his abilities to play with the consciousness of people in order to make his point: please register and pay up the outstanding arrears, or else be cut off.²⁵ The effects of his speech transpired the ensuing days. Many people from block B came to pay their maintenance fees. In August-September 1995 six plot holders changed registration and split the land into two or three different plots, according to the then living heirs who made use of the plots. This number compared favourably to only one registered change during the whole of 1994.

At the final general meeting of the season on August, 2, most irrigators could no longer conceal their anger. Most of them had reaped a disappointing bean harvest or nothing at all. The wheat that had been planted in the beginning of July was withering on the land. After an initial revolt against the IMC who were discarded as a bunch of window dressers, Agritex staff was asked to chair the meeting. Next, attending Agritex staff were accused of staying in their offices while the crops withered, receiving maintenance fees whilst not maintaining the scheme, being land development officers whilst not developing the land and withholding irrigation to those who fought in the war for the right to irrigated land. The old hobbyhorses of lack of communication, over-riding bureaucracy and failing supervisors were articulated in various guises. At a certain moment the floor demanded to see the top most guy. The irrigation officer, who had initially ducked, was dragged in front of the meeting. He once more explained Agritex' position with regard to the pumps, the lack of general hands to do

²⁵ The irrigation manager was also rumoured to master spiritual powers, which may have added to his ability to exert some form of authority. In an interview he admitted he acted as a *mudzimu* (spirit medium for ancestral spirits) for some time, when he was the African supervisor in neighbouring Deure irrigation scheme. Interview with irrigation manager Nyanyadzi, Mudanda, 27 October 1997.

proper maintenance and the failing approach of the IMC. The meeting ended in chaos, with various leading people shouting each other down for having swindled money from the co-operative, supporting the opposition in order to facilitate a take over of the scheme by a conglomerate of businessmen, and seeking political capital out of Nyanyadzi's misery.

Graph 6.2: Crop water balance for block BN, March-August 1995



Considering the unreliability of crop yield estimates provided by Agritex, I have given a calculation of crop water demands and crop water supply during the winter season for block BN (see graph 6.2). Serious water shortages were experienced in the beginning of June and from half July onwards. This resulted in a below normal yield for beans planted at the end of March (8 hectares); considerably below normal yield for beans planted halfway April (17 hectares) and no or very scant yield for beans and tomatoes planted in May (3 hectares). The wheat that was planted from June onwards (over 7 hectares) reaped nothing at all. After a short lived revival of one pump (9 to 18 August) the pump house closed down for the final time. Another dry winter season had passed in Nyanyadzi irrigation scheme...

6.4 TURN-OVER BY DEFAULT

The politics of the Irrigation Management Committee

The evidence provided above shows that the IMC has been successful at resisting Agritex' efforts to revive the factory management style. This feat was achieved through the mobilisation of politicians at the local, district, provincial and national levels. One may wonder what role the IMC was actually playing in operation and maintenance activities in the irrigation scheme. Below a short enumeration of their different activities is given

Ever since the demise of the Nyanyadzi co-operative society at the end of the 1980s, due to alleged mishandling of funds by its leadership and failure to recoup outstanding loans, the IMC was tasked with the negotiation of cash crop contracts with horticultural companies in

Mutare.²⁶ The IMC in close cooperation with the local Agritex office signed the contracts, which specified the acreage to be grown, minimum price to be paid by the company and exclusive marketing rights of the company. However, the contracts were frequently breached due to 'side-marketing' by individual farmers who sold part of their harvest to passing traders. The IMC failed to curb this practice, which in turn frequently resulted in the company not fulfilling its transport obligations, leaving the tomatoes to rot in the scheme. By 1995, the Nyanyadzi plot holders had built a reputation for being unreliable partners, complicating the task of finding an interested company to sign a crop contract.

The IMC and block IMCs have only to a limited extent been able to enforce their own byelaws,²⁷ due to a lack of authority. For instance, when the IMC chairman wanted to impose a fine on someone who had stolen water, the perpetrator responded violently (Bolding 1996, 78-9). A meeting was called and the chairman rendered his resignation. Only after the Irrigation Officer had called the culprit to his office to confirm the fine, did the IMC chairman have the courage to resume his post. IMC meetings normally ended in a brawl, with various people accusing each other of wrongdoings. The block IMCs and IMC provided the stage for different political factions to air their concerns and point fingers at their opponents. Furthermore, the IMC has been led by a limited group of (rotating) people that have built up a leadership record in Nyanyadzi, often dating back to the early 1960s. Their personal records were frequently tarnished by past conflicts connected to the war, co-operative swindle, or supposed interest in big business (see 8.2).

The IMC's involvement in actual water distribution has been minimal. Water distribution is done by the water bailiffs, who are accountable to the local Agritex office. Their role is critical. They know the system and its complex waterways by heart, though their skills are often little appreciated by the management.²⁸ It is they who translate the official list of plot holders, with up to 50% of the registered plot holders dead, into the real people on the ground. They know exactly which sons and widows have inherited the numbered plot of a deceased plot holder. From their daily negotiations along the system's furrows they also personally know the daughters, *murooras* (wives) and paid labourers that work the plots. They also know the intricacies of sub-leasing of plots, selling of plots and other deals that are made with regard to the use of a particular piece of irrigated land (see 7.3). However, by reporting according to the official plot numbers and by using the names of the registered plot holders, they kept the official Agritex reality alive. In 1996 four of the six water bailiffs were demoted and added to the maintenance gang as general hands. This move further impaired the government control that was left over the actual distribution of water.²⁹

After the 1994 events at the pump house, the IMC was formally tasked with mobilising labour from all blocks to deal with siltation problems at the main canal or pump sump. However, in most instances few plot holders fulfilled their labour obligations. The bulk of the

²⁶ These contracts concerned mainly beans and tomatoes, grown during the winter season. Most Nyanyadzi plot holders depend on these crops for their cash income.

²⁷ The byelaws were primed on those used in the 1970s and basically entail the central tenets of the factory paradigm.

²⁸ Part of the skill of an experienced water bailiff comprises an internalisation of the interplay between canals, water and gates (*cf* Van der Zaag 1992a). Newly employed water bailiffs learn the system by trial and error, but also from experience imparted by senior water bailiffs. Of the six water bailiffs that operated in Nyanyadzi in 1995, four had extensive experience dating back to the early 1970s.

²⁹ Whether this move was part of an ongoing financial reform saving on wage expenditure or the result of a personal vendetta of the CAEO against the water bailiffs' capacity to obscure the names of actual plot holders, is not clear.

labour force cleaning the main canal was provided by block C plot holders (see 8.1). Initially, the IMC had only limited involvement in emergency operations, like the repair and follow-up on the repairs of pumps. However, during winter 1995, local Agritex staff started to put pressure on IMC members to go and see the Provincial Water Engineer themselves to enquire about the repairs of the pumps.³⁰

Turn-over by default: devolution of financial obligations from 1996 onwards

Towards the end of the 1990s two concurrent processes were responsible for a *de facto* devolution of financial responsibilities from the government to smallholder irrigators. The first process concerned the proposed commercialisation of the DWD through the formation of the Zimbabwe National Water Authority (ZINWA). This authority was supposed to operate like a para-statal, sustaining itself by selling water from government dams. In October 1995, the Provincial Water Engineer and the national newspaper *The Herald* announced that smallholder irrigation schemes were to pay for their water at the rate of the national blend price.³¹ Agritex irrigation engineers held meetings and decided that these costs could not be borne by smallholder irrigators. However, in 1998 the ZINWA Bill was passed by Parliament and by 1999 ZINWA was operational. Secondly, the on-going restructuring of the public service and increasing budget constraints under the structural adjustment programme resulted in a shortfall on the operational budget of the DWD, required to cover the electricity bills for the Nyanyadzi pumps. The ZESA bill covering the period from July 1995 to 31st of January 1996, amounted to Z\$ 373,980, whilst the budget allocated to the DWD for Nyanyadzi for the whole financial year (July 95 to June 96) was only Z\$186,000. The short-fall (Z\$ 187,980) was presented to Agritex, which refused to pay and suggested to recover the outstanding amount from the Nyanyadzi plot holders. However, the Provincial Water Engineer (PWE) refused to come down to Nyanyadzi to explain the problem to the plot holders. Instead, he left Agritex personnel to do the job, since they had 'more experience with dealing with farmers'.

In July 1996 the IMC managed to collect Z\$20,000 from plot holders in blocks A, B and D to cover for the electricity bill from May to July 1996. The plot holders, however, contributed the money on the understanding that they would get it back: they thought it was only meant to help out DWD during the last months of the financial year. When it transpired that the electricity bills were to be paid by them at the end of each month, they refused, arguing they could not bear the costs. The Zimbabwe Electricity Supply Agency (ZESA) was then forced to close the pump station.

In August 1997, the PWE announced further charges on water supplied by his department as per the 1st of September. Using a flat application rate of 12,000 m³ per hectare per year and a rate of Z\$145 per 1,000 m³ supplied, the water charges amounted to Z\$145 per month, to be collected by the IMC.^{xxviii} This time Agritex declined to act as the messenger of bad news. At a widely attended meeting, the Nyanyadzi plot holders refused to foot the bills on account of

³⁰ Partially this action was the result of mounting frustrations of the Irrigation Officer regarding the non-fulfilment of obligations by DWD. He was fed-up with being blamed by plot holders for responsibilities that were formally speaking not his. In a letter to the DAEO Chimanimani, the Irrigation Officer referred to the repeated failure of the DWD to supply manpower to desilt the pump sumps: 'This office (Agritex Nyanyadzi) is being seen as the most devil which has ever existed in the history of the scheme, whilst nothing ill is being spoken of the very people who are responsible (meaning DWD, AB)'. Agritex Chimanimani District files, 20 June 1994.

³¹ The national blend price was at the time Z\$47 per mega liter (1,000 m³). In 1997 it was raised to Z\$185 per ML (16 US\$ per ML). Nyanyadzi irrigators require on average 18 ML per year per hectare for three cropping seasons.

DWD's failure to operate the pumps and the continued reliance on maintenance labour provided by the plot holders themselves. In addition plot holders resented the idea of government charging for water, which was a 'God-given' resource. They shouted the DWD staffers down and demanded to see the Minister.^{xxix}

Since then Nyanyadzi irrigation scheme has relied mainly on water supplied by the Nyanyadzi river. Effectively this has split the scheme in two: block C plot holders who irrigate first, and blocks A, B and D that have to wait and hope some water has been left. Luckily 1996/97 and 1997/98 were above average rainfall seasons, allowing for continued irrigation. However, during the winter of 1998 the scheme was closed due to a lack of water in the Nyanyadzi river (Manica Post, 1998).

6.5 CONCLUSION: DEMISE OF THE NYANYADZI IRRIGATION FACTORY

This chapter has described the fate of Nyanyadzi scheme during its post-Independence life, from the perspective of its management. During the mid-1990s, the dominant feeling amongst the Agricolos running the scheme and most of the plot holders depending on the scheme for their livelihood was that Nyanyadzi's status as a 'garden of Eden' had evaporated some time between 1980 and 1996. In terms of life phases this period could perhaps best be characterised as a 'mid-life crisis' with the associated feelings of a loss of direction, longing for an idealised past, and concurrent urge to re-invent oneself. The push for reinventing the smallholder irrigation sector was provided by a multitude of (inter)national funding agencies. The transformation entailed a variety of donor funded experiments with farmer managed irrigation schemes as well as a stream of policy papers articulating the desire for user management on a firm financial basis. Yet, the old guard longed for a revival of the irrigation factories, a feat that was difficult to achieve in the face of political opposition and the provision of highly subsidised services to the country's smallholder sector.

Policy discourse disconnected from policy practice: IMT by default

This chapter has demonstrated the existence of two different policy arena's for irrigation management, which operate simultaneously yet firmly at odds with each other. One arena, that of policy discourse, is centred around the upper echelons of the bureaucratic apparatus and shops for work in the capital and major tourist destinations, paid by funding agencies interested in the future of smallholder irrigation. Another arena, that of policy practice, is located in the periphery of the bureaucracy and country, but at the heart of the smallholder irrigation schemes and deals with the nitty-gritties of negotiating the movements of water, politicians, plot holders, sand, and pumps in unwilling water works.

The policy discourse arena can be likened to a migrating circus. The main artists in this circus were key policy actors, representatives of donor organisations, NGOs, private consultants and researchers. The circus acts concerned the trading of views on the need for, and modalities of, future development of smallholder irrigation sector. Their output was a consistent stream of policy initiatives and papers that resulted in the emergence of an elaborate policy discourse on irrigation management, which however was not cemented in officially endorsed policies and departmental instructions. The central tenets of the new policy discourse, e.g. user management and cost recovery, were firmly in line with the dominant discourse on irrigation management that had emerged in the international water policy arena.

The heavy donor involvement in the development of the smallholder irrigation sector produced mixed effects. Counted on the positive side are the increased technical (design)

capacity that slowly permeated into the Agritex irrigation branch as a result of overseas and local training programmes, and the construction of mostly farmer managed smallholder irrigation schemes during the 1990s, expanding the sector. Agritex developed an in-house irrigation design capacity that included elements of farmer participatory design, such as the simultaneous development of a number of technical options for each scheme, which were presented to the ultimate users (Manzungu and Van der Zaag 1996b, 18). Exposure to novel ideas on irrigation management as well as novel irrigation technologies (drag-hose sprinkler and drip) diversified Agritex' approach to smallholder irrigation.

However, the trained irrigation officers that formed the core of the irrigation branch at provincial and district levels were committed to irrigation design rather than operational irrigation matters. Their emphasis on 'scientific' water management, based on daily calculations of crop water requirements, was ill suited for the old irrigation schemes that were badly equipped to operationalise such a sophisticated management system. The new emphasis on sprinkler and drip technology for smallholder irrigators, was primed mainly on the 'in-built management' qualities that were ascribed to these closed technological systems (Chitsiko 1995, 15). Yet the increased levels of energy and concomitant costs that such (pump) systems require did not auger well with the stated aim of farmer management (Manzungu 1999, 35; Chidenga 2003, 256).

Whilst the emergent policy discourse emphasised the need for increased involvement of irrigators in both managing and financing their schemes, one of the contradictory effects produced by increased donor funding for the sector was the expansion of the state bureaucracy managing the schemes (*cf* Ferguson 1990). Furthermore the competitive wage packages offered by the donor sector provided the impetus for an ongoing brain-drain of highly trained irrigation officers out of the public sector, nullifying the innovative effects that their sustained service with government might have produced. Those who remained in government service were either insufficiently trained or too senior.

The latter were instrumental in shaping the dynamics on the ground, i.e. policy practice. The freshly promoted African irrigation managers that took over from their white predecessors were all experienced men in irrigation and firmly committed to the idea of strict government supervision. The absence of clear policy directions in black and white, meant that this old guard of managers was left to their own devices. The Derude policy statement could be interpreted as a continuation of old policies, whereby the three annually renewable permits were key in centralising managerial authority in the hands of the irrigation manager and the IMCs were supposed to instil discipline amongst plot holders, much like the kraalhead committees had done before. The modalities of the resettlement programme, that also included the three annually renewable permits to reside, cultivate and depasture, confirmed the government's commitment to the past agrarian order. Other pointers that the government was not intending to lessen its control over the rural constituency were provided by the technocratic mode of decentralising local government. The decentralisation effectively concentrated decision making power in the hands of non-elected government technocrats, whilst leaving the vagaries of implementation to the elected bodies of local governance. The ultimate hand-over of management responsibilities to the IMCs could be postponed until such time that the plot holders had proven capable of shouldering the running costs of their schemes. Furthermore none of the irrigation managers had any experience with handing-over management or fostering user involvement.

However, the revival of the managerial order was foiled by politicians that were not prepared to let technocratic concerns override electoral gain. The wartime promises of free services and relaxation of government control over agricultural operations, were in direct contradiction with the revived commitment to the past agrarian order. Lacking political backing and crippled by budget cuts the management resigned into a holding operation, relying to an increasing extent on resources mustered by the plot holders.

The two separate policy arenas hardly exchanged their differing views. Donor-initiated workshops did provide a venue for local government staff to air their concerns, but these were normally smothered by their superiors who were cautiously guarding the basis for sustained consultancy assignments involving the formulation of a different future for the smallholder sector. Plot holders rarely attended such workshops. Neither could they afford the transport expenses nor did the convenors invite them, since their voice was represented in consultancy reports that were based on rapid rural appraisals. Agritex in-house workshops, such as the one held in Mutema, did provide avenues for open debate amongst field staff and the directorate. These debates were marred by confusion and normally resulted in the affirmation of the colonial managerial order reflected in the Derude policy document.

The emergence of gaps in the policy process between official law, policy discourse and policy practice can be attributed to a number of simultaneous processes that provided insurmountable administrative hurdles. Where Alvord primed his irrigation policy efforts on the unintended effects produced by the expanding Save water-network, whilst running the scheme as a personal fiefdom, the expansion of government departments during the 1950s led to a more impersonal management style primed on the policy concerns of the actors in charge of African irrigation schemes. These different actors (Agricolas and Administrators) acted firmly in line with the political aspirations of the Rhodesian state, though their views differed on what developments should receive priority and which means should be employed to achieve these aims. After independence the political aspirations of the ruling party were at odds with the agrarian order that was implemented by the bureaucratic apparatus. The ongoing growth of the government bureaucracy, professionalisation of its cadres, and disciplinary orientation of the different departments involved in the water sector, resulted in a quagmire of policy actors. The process of co-ordinating development efforts became a complicated affair, whilst the process of endorsing policies into official law involved many steps and many actors (see Manzungu *et al.*, 1999; Manzungu 1999, 26).

In 1996 a process of turn-over by default shifted the onus of the financial burden of running the scheme from the government to the users. This abrupt hand-over did not occur by plan, but was the result of a number of concurrent changes. Dwindling budget allocations to DWD and Agritex combined with increased charges for the water used by the scheme, both the result of neo-liberal policies, forced the management to resort to the plot holders for generating the money required to keep the pump house operational. However, the majority of the plot holders resented both the financial burden presented by the pumps and the impotence of DWD and Agritex to turn the pumps into reliable partners. Nyanyadzi plot holders refused to contribute to its continued operation. To counter the imposition of charges on what was perceived to be a God given resource, plot holders from several irrigation schemes in the Save valley united in a new lobby group, called the Manicaland Plot Holders Association. This organisation signified the first entry of smallholder irrigators in the policy arena. Chapter 8 shows how various quarters of the Nyanyadzi community set out to realign the ailing network, saving on energy costs, whilst re-appropriating the scheme.

The difficulty of wielding water control in Nyanyadzi

Nyanyadzi's management faced an uphill task in its attempts to revive the managerial order that had proved so productive during the network's life as an irrigation factory. Their failure to wield water control over the unwilling works in Nyanyadzi had little to do with the existence or absence of a clear-cut irrigation management policy. Below an assessment is given of the three dimensions of water control that ultimately precluded Nyanyadzi's durability as an irrigation factory scheme.

Physically it proved difficult to mobilise sufficient water for the scheme's crops. Drought induced water scarcities resulted in (partial) crop failures in 1983, 1988, 1990, 1992 and 1995. Thus the network proved no longer capable of providing food security during times of drought. Nyanyadzi plot holders qualified for drought relief packages in 1992 and again in 1995 and 1996.

The unreliability of the Nyanyadzi river more or less forced the management to continue its quest to transfer Odzi river water into the scheme. However, the pumps proved susceptible to frequent breakdowns, in part caused by siltation and river floods. The pumps created dependencies on other actors (DWD, pump repair firms) and foreign spares, whilst demanding a continuous injection of energy (finance and labour). Translation and co-ordination of all these different elements into a working whole proved beyond the control of local actors. Design faults in both type and location of the pumps further compounded the quest for control. Thus, in spite of the increased physical capacity to control Odzi water flows, through a large storage dam and increased pumping discharge, the water-network remained dependant on the Nyanyadzi river.

Yet the control over Nyanyadzi river water flows within the canal network was at best limited. Some of the lined arteries of the network were too narrow to push the life-blood to its outer corners (blocks B and D), whilst the aorta of the system (the main canal) was found to be badly leaking. Furthermore the flash floods originating from surrounding dry land as well as increased silt loads contained in the Nyanyadzi river, clogged critical parts of the network, whilst eating away irrigated land. The increase in sand depositions was blamed on a lack of government control over the land use practices of both Nyanyadzi's inhabitants and the population in the upper catchment. The management's attempts to compensate for this lack of managerial authority by putting up technical bulwarks (gabions, dry dams, scour gates, silt traps) stopping or diverting the silt loaded water proved not strong enough. As a consequence the Nyanyadzi water-network slowly lost its character as a bounded entity, distinctive from its sociotechnical environment.

The enactment of physical control over water flows through the network was not helped by its increasing complexity over time. The net effect of pump breakdowns, translocation of pump stations and their points of discharge, and failing river supplies has been a continuous shift of the physical location of the head end of the scheme from one block to another. Whilst during the early stages of the big Nyanyadzi network the head was located at the eastern side of block A, the opening of block C along the main canal in 1943 yielded that block poll position. The construction of the first Odzi pump station in 1957 facilitated the emergence of two top end locations, block C and the western side of block A. The new Odzi pump station discharging at two different locations shifted the top location once more to block A North and the eastern end of block A. The institution of a new water rotation schedule during winter 1995 once more shifted the top end across time. These continuous shifts may have prevented

the emergence of preferential treatment and concentration of capital in one particular location of the scheme.

Managerially, the model of strict government supervision with a central role for the irrigation manager was actively contested. The role assigned to the IMC was to maintain internal discipline, much like the kraalhead committee before the war. Yet their role in facilitating managerial control over the plot holders was limited. The plot holders refused to grant authority to their own elected leadership, rendering the IMC ineffective in controlling side-marketing, arbitrating cases of water theft, or mobilising labour for maintenance activities. Rather the IMC acted as a unified platform to resist the imposition of the old factory order. Whereas internal strife within the politically divided Nyanyadzi leadership was often cited by Agritex as a legitimate reason for sustained government primacy, such political splits did not affect the emergence of collective resistance against government control, as demonstrated vividly during the 'physical exercise' of 1989.

Faced with recurring water shortages and a sense of impotence with regard to the failing pump station, the Agritex office resorted to an expansion of its managerial control upstream along the Nyanyadzi river. Yet the upstream raids did not result in much relieve for the scheme's water woes (see chapter 9). Internal water scarcity management strategies during winter 1995 consisted of a cut in irrigated acreage (a time-tested solution) and the institution of a new water rotation schedule. Whilst the one-acre rule did little in terms of limiting the acreage, since the management did neither have proper information on the plots nor the means to enforce the rule, the concentration of water supply to one instead of all blocks simultaneously helped improving the water supply at plot level. Striking is that the design of the first water rotation schedule, crafted by Agritex staff in consultation with the IMC, was not based on the size of the blocks nor on the list of plot holders included in the bean crop contract. This was quickly corrected by the water bailiffs, who drafted the second schedule that was more in tune with actual water demands in the blocks. The subsequent revision of schedules reflected the outcomes of an ongoing negotiation process between the users of different blocks and Agritex staff. Thus the introduction of water rotation schedules resulted in more open negotiation processes around water distribution, involving public debate and general votes, creating more awareness amongst both staff and plot holders of the intricacies of the water-network. Yet, the failure of the pumps put a premature end to the season, depressing the crop yields.

Over time knowledge of the intricacies of the water-network became the exclusive domain of the water bailiffs, who acted in this respect like gatekeepers in a double sense. Their mastery over the water filled the gap left by a retreating Agritex office. The technical skills of the new irrigation officer, trained in crop water requirement based supply, were largely divorced from the operational realities of running the scheme. Day-to-day management had been devolved to the irrigation supervisor and his staff that however lacked the necessary political backing to revive the strict managerial order of the past. The technologies of control that had been critical in securing managerial control over the agricultural operations of the plot holders, were not longer available. They either lacked a legal basis or were affected by a propensity amongst agricultural staff to resign to office work creating a knowledge gap on what was happening on the plots. Social skills and speech acts drawing on locally available cultural repertoires became essential for supervisors of the old guard to maintain a semblance of authority. In contrast the water bailiffs internalised both the physical and social characteristics of the water-network. They were critical in keeping the office reality alive, whilst performing the daily navigation of scarce water amongst the multitude of plots and

living heirs of officially registered plot holders. Their critical role is clearly demonstrated by the failed implementation of the one-acre rule, which did not augur well with their status as fellow plot holders. The Nyanyadzi water bailiffs were not unique. Manzungu (1999, 96) confirms their skill of negotiating water in the Chibuwe and Mutambara water-networks. However provincial Agricolos did not appreciate this skill. Forced to implement stringent financial reforms, the number of bailiffs in Nyanyadzi was reduced from six to two, seriously impeding the little managerial control the local Agritex office could still claim to muster.

Socio-politically, the government lost its grip over the plot holders. Nyanyadzi's reputation of voting for the opposition, alternatively formed by the NDONGA party led by Ndabaningi Sithole and the ZUM party of Edgar Tekere, led to a careful strategy of appeasement on the part of the ruling ZANU(PF) government in order to secure the Chimanimani parliamentary seat. Plot holders actively exploited this characteristic, wresting resources out of the ZANU(PF) government by threatening to vote for the opposition, and subverting attempts of local staff to impose strict managerial control, by reminding the ruling party of its war-time promises of free services. A gradual shift occurred from government to user control, not by plan on the part of management, but by default since the management lacked the financial resources and technologies of control to avert such a move. The increased reliance on labour provided by the plot holders to clean the main canal and pump sump were pointers of this impending process. Slowly the scheme was re-appropriated by its divided users through the mobilisation of a variety of counter discourses and alignment strategies, that drew inspiration from the opposition status of the area, the legacy of the war and a sense of ownership over the network. The next chapter turns to this subject and provides a diachronical perspective on this process, which produced two different modes of re-appropriation enacted by different quarters of the Nyanyadzi community.

Within this context it is quite understandable that the irrigation manager of Nyanyadzi likened irrigation management to 'riding on a wild horse'.



Photo 11: Silted Nyanyadzi intake weir, river dry, June 1995
(Source: Alex Bolding photo)



Photo 12: Nyanyadzi intake weir, river flooded, March 1996
(Source: Alex Bolding photo)



Photo 13: Furrow irrigated at former MuNyanyadzi command area, Tsianwa, June 1997
(Source: Alex Bolding photo)

THE USERS: DIFFERENT IDIOMS OF ACCUMULATION ACROSS GENERATIONS

Thus far most attention in the technography of the Nyanyadzi water-network has been paid to the shaping and crafting role of both water and different intervening actors. This chapter focuses on the actual objects of irrigation based modernisation, the users. How did they experience the successive attempts to remould their livelihoods? And in what ways did they actively re-shape, re-mould, and re-craft parts of the water-network to suit their own interests?

The chapter opens with a brief overview of livelihood strategies that African irrigators apply in farmer managed systems (7.1). The section brings to light that irrigated agriculture in indigenous African systems is only a complementary activity to livestock or rain-fed production. The same trend can be observed in the so-called paradigmatic/factory schemes, where settlers employ a variety of strategies to counter or undermine managerial control over their labour and land. The next section (7.2) re-looks at the emergence of nationalist inspired resistance to the scheme's management in Nyanyadzi and unravels how different farming strategies resulted in two types of plot holders that each had their own reasons to support the struggle. By highlighting the effects of inheritance and investment patterns across different generations of Nyanyadzi plot holders, it is shown how political splits in the Nyanyadzi community after independence came to reflect different livelihood orientations and vice versa. The next section (7.3) provides an insight in present-day differences in livelihood strategies pursued by plot holders of different religious and political orientations. Two cross-generational accumulation patterns come to light that produce a different understanding of how plot holders over the years have appropriated the Nyanyadzi water-network (7.4). These differences throw a new light on contemporary debates on smallholder irrigation and livelihoods, impinging on the relationship between plot sizes and economic viability, the gender effects of irrigated production, the cultural dimension of risk avoidance, and the interplay between the sociotechnical environment of an irrigation scheme and the development of livelihood options by its users.

7.1 AFRICAN IRRIGATION AND LIVELIHOOD STRATEGIES

The promise held by well executed technographic research on irrigation is to produce working schemes by calibrating existing modes of organisation and production with those imposed by irrigation factories (Richards 2002). The quest for harmonisation of existing practices with those imposed by modern technology has taken up a prominent place within the irrigation community after the watershed of criticism directed at modern, imposed irrigation schemes that was unleashed in the 1980s. The quest has resulted in a myriad of policy recommendations that can be broadly categorised in four different discourses. Firstly, there are the 'small is beautiful' advocates, who presume that issues of scale are decisive in success or failure of African irrigation. A second school advocates the importance of farmer and or community management, blaming failures in smallholder irrigation on the centralised

and bureaucratic nature of the agencies managing schemes. A third school advocates the propagation of private, large-scale irrigated estates (either in individual or transnational ownership) as the ideal way to attain food security and increased export production. Finally a fourth discourse stresses the need to rehabilitate and modernise irrigation schemes, blaming their low performance on faulty designs.

It is my contention that the demise of irrigation factories in Africa since the early 1980s cannot be blamed on singular factors such as scale, bureaucratic control, lack of market incentives or use of faulty irrigation technology. Rather, the demise of the factory model of irrigation can be attributed to a large extent on the strategies of re-appropriation by the users themselves. These strategies have been informed by existing dispositions and livelihood practices. The aim of this section is to characterise these existing, alternative modes of production and livelihood practices and determine how these have informed strategies of re-appropriation and development of counter-discourses in irrigated settlements like Nyanyadzi. For this purpose common patterns in indigenous African irrigation systems are reviewed. Next, it is briefly highlighted how the first generation of Nyanyadzi irrigators reacted to, and was transformed by, its engagement with irrigated agriculture.

The indigenous African irrigation paradigm

A basic outline of the African indigenous irrigation paradigm is provided in table 1.1 in the introductory chapter. What follows below does not represent an exhaustive review of all aspects of indigenous irrigation systems on the African continent. Rather a number of principles of indigenous irrigation are highlighted from a limited number of (case) studies on farmer managed irrigation systems in Eastern Africa (Kenya and Tanzania).

Complementary nature of irrigation: risk spreading

The engagement in irrigated production in all cases studied does not represent the epitome of an evolutionary pattern of agrarian development from hunting, to pastoralism, to sedentary rain-fed agriculture, to intensive irrigated agriculture, as many agricultural modernisation narratives suggest (e.g. Allan 1965). Rather irrigated agriculture is practised as a complementary activity to prevailing livelihood practices of rain-fed cropping or livestock rearing (Adams 1992, Adams and Anderson 1988, Adams *et al.* 1997, Fleuret 1985, Hogg 1987, Sutton 1989, Vincent 1995). Adams (1992) even challenges the definition of African irrigation systems as models of intensive agriculture, preferring to view them as forms of risk management, which complement rain-fed extensive cultivation (McCan 1991, 511). Except for the Sonjo (Gray 1963) none of the Africans engaged in irrigation are full-time irrigators (Fleuret 1985, 108). The nature of irrigated production is such that it is flexible and responsive to opportunities offered by water and markets, whilst it presents only an occasional or temporary recourse within a range of economic opportunities that can be seized (Adams and Andersson 1988).

Lineage based organisation of irrigation furrows

Indigenous irrigation in East Africa is closely associated with clan based society. Fleuret (1985, 113-4) has argued that canal organisation in the Taita hills, Kenya, closely resembles the principles of lineage segmentation. Thus the physical features of the water-network reflect the social network that runs it. In his view the irrigation network can be conceived as

'a physical expression of historical and ongoing social processes. Access to water is regulated by the same mechanisms that regulate access to land, livestock and marriageable women: that is the relations embodied within the dense web of affinal and agnatic ties that is the principal feature of Taita social organisation.'

Other literature on farmer managed irrigation networks in Eastern Africa (Adams and Anderson 1988, Adams *et al.* 1997, Gray 1963) broadly confirms the pivotal role of clan leadership in both the material and managerial organisation of irrigated agriculture.

Use, management and maintenance of the furrows: hydraulic property

The actual use and modes of organising management and maintenance of farmer managed furrows is informed by the property relations that exist between the users and the furrow and amongst the users themselves. The notion of hydraulic property (Coward 1986a) captures the nature of such property relations that in turn inform the underlying functioning of indigenous irrigation furrows. Often the investment of labour and other resources in the construction of a furrow results in both entitlements and obligations with regard to the use of the furrow water as well as the maintenance that the network requires. The initial investment process defines individuals' relative positions towards the property object and towards each other. These property relations constitute the basis for collective action in various irrigation tasks (Coward 1986b), whilst at the same time providing the basis for excluding outsiders from interfering with its use (Gerbrandy and Hoogendam 2002). Thus access to irrigation water is often mediated by the investment of labour in furrow maintenance, which in turn is primed on previous investments during construction of the furrow (Adams *et al.* 1997). Often the principle of proportionality applies to rights and responsibilities. The resulting allocation of land and water may not be egalitarian, but based on the distribution of status (Fleuret 1985, 113). Whilst many indigenous irrigation furrows lack specific organisations like furrow committees (Adams *et al.* 1997, Cleaver 1998) conflict resolution and initiation of maintenance activities are frequently mediated by clan elders (Adams and Andersson 1988, Fleuret 1985). Furrow water is almost always used for multiple purposes (irrigation, domestic, and livestock). Actual distribution of water is flexible and subject to negotiations. Water turns can be swapped amongst furrow irrigators, whilst the limited access to furrow water of women is mediated through water sales (Adams *et al.* 1997, Grove 1993).

Initial response to the Nyanyadzi water-network: from plot owners to plot holders

In irrigation factories the articulation of counter-discourses and concurrent deployment of strategies of re-appropriation is informed by the existing repertoire of cultural dispositions that define the relationship between human actors and their natural environment (Bourdieu 1977, 1990). Equally formative are the actions of interveners. In this sense the process of re-appropriation can be likened to the third physical law of Newton: action is reaction. The employment of new water based technologies by outsiders provides an opportunity to redefine pre-existing relationships with water, in turn redefining the identity of the actor engaging in such a novel undertaking. Comaroff and Comaroff (1992, 235-63) provide an example of this process, by relating how the introduction of irrigation at Mission stations in Botswana in the long run forced the local Setswana people to transform their idea of the self. Yet there is more to it than the transformation of social identities.

As shown in 4.1, local inhabitants of the Nyanyadzi area had already engaged in some form of irrigation (transforming the concept of *matoro*) before Alvord and his demonstrators introduced the MuNyanyadzi furrow. The practice of *matoro* wetland cultivation was informed by a general principle of bringing the crops to the water, in sharp contrast to the concept of irrigation that entails the bringing of water to the crops. Yet, the ridges constructed in riverbeds to grow maize and rice, had already been transformed into furrows to bring the water from the river to the roots of the ridged crops, transforming the practice of *matoro*. This transformation may well have been informed by the activities of missionaries in Mutambara and European settler farmers in the upper Nyanyadzi catchment. Yet, wetland cultivation was

a labour intensive form of cultivation and always part of a wider portfolio of livelihood strategies, such as the rearing of livestock and extensive cultivation of rain-fed land.¹

Alvord's initial approach to the Africans residing along the Nyanyadzi river was cautious. He first asked permission of local traditional leaders and sought appeasement of the ancestral spirits by means of a token ceremony. The local traditional leadership felt compelled to join the MuNyanyadzi scheme in order to sustain their authority, despite suspicions of a 'whiteman's ploy'. Headman Nenohwe, kraalhead Nyanhanda, and *mupurisa* Chimoyo Jena administering the area of the scheme all joined. Their authority was reflected in the two-acre holdings they got distinguishing them from ordinary kinsmen. But not all traditional leaders joined,² suspicious as they were of the government's intentions. After the sudden, inexplicable, death of one plot owner (Manzini) some other plot owners abandoned the scheme, interpreting the death as a sign of dissent of the ancestors.

The initial response of the MuNyanyadzi plot holders was to include the irrigated acres in their portfolio of livelihood activities. Irrigated production was complementary to existing rain-fed and livestock production and income generated from migratory labour employment. The irrigated acres were left unstumped. Homesteads remained where they were. Proceeds from the sale of irrigated maize were invested in cattle. However, the work involved in destumping of the plots, repeated digging of the main and lateral furrows, and continued re-enforcement of the weir, soon started to interfere with other activities that required labour. This is reflected in the occasional refusals and general reluctance of the plot owners to supply labour as and when required by supervisor Sigauke. By instituting water rates the need for voluntary labour provision at the request of the irrigation supervisor was obviated. The same move turned the irrigators from plot owners into plot holders.³

Yet as late as 1939 the plot holders preferred to cultivate rain-fed crops on the surrounding dry land, feasting on the beer brewed. New regulations made that harder but not impossible. A series of successive droughts soon resulted in the irrigated plots becoming the mainstay of livelihood. Yet the water rate increase of 1942 was widely resented and presented some with the final straw to abandon the scheme. Opposition was thus expressed by threatening to abandon the scheme or outright evasion. Yet the simultaneous availability in 1942 of a market and new profitable crops proved the viability of irrigated agriculture as a labour efficient way of production. During the mid-1940s a new type of plot holder arrived on the scheme, comprising a tiny mission educated elite that viewed irrigated agriculture as a means to generate wealth and sustain upward mobility. These modern men and women were more cosmopolitan in outlook than the original lot of plot holders. These new arrivals shared a common background as successful professional labour migrants, originated from outside Nyanyadzi and settled in the scheme at their own will. They comprised the epitome of Alvord's modernisation model.

¹ Both the work of Mtetwa (1976) and McGregor (1991) on wetland cultivation in central Masvingo province during the early part of the 20th century point at the propensity of lineage elders to control this valuable type of land, since lineage elders controlled the greatest labour force. Youngsters opposing such lineage authority were greatly assisted by the spread of the plough from South Africa around the same time. The plough allowed young couples to evade lineage control over their labour by opening up extensive stretches of land in the upper reaches of valleys.

² Kraalhead Dirikwe ran away. He only joined the later Nyanyadzi scheme. Representatives of headman Matyashe shied away from joining the scheme, since they owned well-watered lands upstream along Nyanyadzi river.

³ The move entailed a form of property extinction (Coward 1986a): authority over the land and hydraulic infrastructure shifted hands from traditional leaders to the government.

However, no sooner had the modernisation project of Alvord born its fruits, or its key proponents started to complain about the constraints imposed by the administration on their entrepreneurial activities and the limited schooling and employment opportunities for their children. The articulation of this discontent took a different form than earlier protests. Letters were written to the administration requesting a fair deal and participation in religious and political organisations articulated the growing desire for racial partnership and equal opportunities based on merit rather than racial origin. Thus the scheme gave rise to two different types of African irrigators: those who experienced full-time irrigation as a radical break with their past means of earning a livelihood, seeking to subsume irrigated production in their existing portfolio; and those who opted for irrigated agriculture as a means to sustain their upward mobility. The intricacies of these contrasting idioms are the subject of the next section.

7.2 IDIOMS OF ACCUMULATION AND AFRICAN NATIONALISM

In this section an analysis is presented how the African nationalist cause and ensuing events during the war of liberation produced lasting splits within the Nyanyadzi community. It is argued that different ways of investing the wealth generated in part by irrigated production combined with political splits among the African nationalists resulted in the emergence of two cross-generational patterns of engagement with the Nyanyadzi scheme. These different means of gaining a livelihood from the scheme informed subsequent modes of user organisation through which the Nyanyadzi water-network was re-appropriated in the 1990s, as will be shown in chapter 8.

Chapter 6.2 has highlighted the reasons why successful Nyanyadzi plot holders rebelled against the state during the period of open African nationalist politics (the peasant option paradox). The successive nationalist parties (SRANC, NDP, ZAPU, ZANU) were supported in Nyanyadzi mainly by teachers, artisans and businessmen that combined irrigated agriculture with a professional occupation and felt constrained in their wealth generating activities by the colonial regime. Mission churches of European denominations (predominantly Methodist in Nyanyadzi) played an influential role in mobilising and channelling this nascent discontent, and thus the nationalist movement became firmly identified with the modernist project started by Alvord *cs.* The African nationalist cause did not only cater for the interests of this modern elite, but received a wide following among Nyanyadzi plot holders by appealing to the interests and fears of the more traditionally oriented producers. Thus besides calling for better education and better wage conditions, the nationalists also denounced imminent destocking measures and endowed their cause with a culturally informed reclamation of *Ndau* pride and independence.

Two different idioms of accumulation in irrigation

From data provided by Hunt (1958) and Roder (1965) it can be deduced that irrigation in the Save valley had given rise to two alternative ways of wealth accumulation that were spatially distributed within Nyanyadzi scheme and across the various Save valley schemes. On the one hand there were the modern, mission-educated producers maximising production per unit of land, whilst re-investing capital in irrigated production and education for their offspring. On the other hand there were the plot holders that operated within the traditional African idiom of accumulation, maximising production per unit of labour, whilst investing agricultural wealth in cattle and expanding the family labour force by marrying more wives (Cheater 1984).

In Nyanyadzi the traditional idiom was spatially concentrated in block C which contained the bulk of the autochthonous population that had been enrolled in the ill-fated MuNyanyadzi venture. The modern idiom was dominant in blocks A, B, and D, which was inhabited mainly by mission educated Africans from Chipinge and Umtali districts. Hunt (1958, 1) found that the levels of expenditure on hired labour were higher in blocks A, B and D than in block C, which relied in the main on family labour. The high proportion of female plot holders in block C points at a polygamous family structure, indicative of the traditional idiom of agricultural accumulation.⁴ The difference in recorded livestock holdings was negligible across the Nyanyadzi blocks (Hunt 1958, 11), yet there are several indications that livestock holdings in block C were larger. In order to avoid payment of dipping fees and the cumbersome job of ferrying cattle to the dip tank at Chimete (far to the south of Nyanyadzi), block C plot holders kept their cattle at the kraals of relatives that practised rain-fed cultivation in the area North of the Nyanyadzi river (Nemaramba). Thus they could also avoid any future threat of compulsory destocking, since the government based their livestock assessments on dip tank records.

A couple of years later Roder (1965, 163) established a close correlation between residence in a pole and mud house and livestock holdings, which he associated with a traditional mode of production. Whilst Nyanyadzi as a whole was deemed the most modern and wealthy of all Save schemes, reflected in the high proportion of plot holders residing in brick houses, high expenditure on hired labour, low livestock holdings, and investment of wealth in agricultural implements; other schemes were either less wealthy or invested their wealth in livestock holdings. Thus the Mutema and Devuli projects were deemed by Roder traditional in orientation, reflected in the presence of strong chiefs,⁵ low production levels, high proportions of mud and pole dwellings, and the existence of large cattle herds (Roder 1965, 165-7). Unfortunately Roder in his surveys did not differentiate between the different blocks in Nyanyadzi.

Weinrich (1975) presents further insights in individual patterns of wealth accumulation in two irrigated settlements, established in the mid-1960s in Karangaland (presently Masvingo province). She shows how the sharp contrast in success of these schemes is tied to either modern or traditional modes of agricultural accumulation prevalent among the scheme's inhabitants. She also shows how success is inherently tied to discontent over the control exerted by the scheme's management. The Mvura plot holders comprised the most wealthy African families, but also the most resentful in Weinrich's study that included two Native Purchase Areas, two Tribal Trust Lands, and two irrigation settlements: 'they know how to make money and they resent being guided in all their activities.' From the individual life histories of six Mvura plot holders it transpires that five of them had a past as professionally employed labour migrants (teacher, police assistant, builder); all were master farmers; and most resented the management's control over their agricultural activities, handling of loans and marketing arrangements:

⁴ The fact that Alvord was desperate for new plot holders facilitated the allocation of plots to women, though this was limited to widows only. When the MuNyanyadzi network washed away in 1942, the plot holders and their wives got new plots allocated in block C. By that time some of the original male plot holders had passed away, leaving behind two or three widows, who subsequently qualified for two acre plots.

⁵ Roder (1965, 173) notes that in Nyanyadzi 'the headmen who are tradition-minded have been pushed aside, and those willing to modernise, especially if they have a modicum of education, have gained in prestige and are sought out for the settlement of disputes.'

'Mvura plot holders who do not want to stay on the irrigation scheme, see it merely as a place where they can become rich in a short time, after which they might buy their own purchase area farms and so become free and independent farmers.' (Weinrich 1975, 276).

In contrast the Zuva plot holders were the lowest earners in Weinrich's sample, tended to value their scheme for its capacity to provide economic security,⁶ and were quite happy to stay in the scheme. From the eight individual life histories presented it transpires that all have worked as unskilled labour migrants in neighbouring South Africa; only two enjoyed some form of education; whilst most males were polygamous, investing their wealth in cattle, whilst keeping their wives and cattle in neighbouring dry land areas.

Case studies of wealth accumulation in Nyanyadzi: modernists and traditionalists compared

Individual life histories of some Nyanyadzi plot holders and their families broadly confirm the two contrasting modes of accumulation presented by Weinrich. The traditionalists in block C were relatively content, but feared further government intrusion in their affairs due to rumours on impending destocking measures. They cautiously nurtured a traditional way of life, whilst claiming the land as part of the *Ndau* heritage. In contrast, the predominantly modernist plot holders in Blocks A, B and D closely identified with the benefits of commercial irrigation, whilst aspiring for better education, better wages, more business opportunities and more control over their own operations, including the marketing of crops. Some, like the Mvura plot holders, viewed irrigation as a springboard to an independent Native Purchase Farm. Others were quite happy with the opportunities irrigated farming offered for attaining a better, modern life. Most invested their proceeds not in cattle, but in the education of their children.

Amos Kombo: nationalist, businessman, plot holder and NPA farmer⁷

Amos Kombo was one of the core nationalist leaders of Nyanyadzi, featuring in Sithole's book (1970). He had been involved in all acts of resistance undertaken by successive nationalist parties and had been detained in 1964 by the Rhodesian regime on account of these activities. His great grandfather was Chief Chikukwa, named Saungweme, who enjoyed local fame for his staunch, but foiled, resistance against the Gaza state. Amos' father had continued the family tradition of royal grandness by marrying three wives, all sisters of Benjamin Muusha, the Chief for Muwushu Reserve. The father ran a successful business at the Chief's residence in Biriwiri, allowing him to pay for the Methodist education of his son Amos.

After school, Amos first started work as a teacher, but soon resigned to help his father at the shop. In 1954 Amos started his own business in Nyanyadzi and was given four acres of irrigated land in block D. Amos was quite successful in his endeavours, buying grain from his fellow plot holders and distributing the grain across the Save valley. From the proceeds he managed to buy a Native Purchase farm at Insukamini, close to present-day Gweru. Amos was quite a wealthy man by the time of his detention. He organised food and study books for his fellow detainees. He paid for a proper education of all his children and those of his brothers and sisters. Possibly because of his nationalist activities, Kombo's success did not go unnoticed. In February 1971 the DC for Melssetter noticed the extent of Kombo's farming and

⁶ The exception was Max, the leader of the Shangaan, who was displeased with the establishment of the irrigation scheme, since he 'feared that irrigation farming would disrupt the traditional way of life of his people and impose many hardships on them.' Reluctantly he moved his people into the scheme, and joined them 'not to make money, but to remain in control of the Shangaan.' (Weinrich 1975, 288).

business ventures. He commented that the management of the irrigation plot, which was undertaken by Kombo's wife, was 'not entirely satisfactory.' The DC suggested to his superior that Kombo should be confronted with a choice, either to have the purchase farm or the irrigation plot.ⁱⁱ Kombo quickly mobilised his solicitors to fend off eviction from his irrigation plot.ⁱⁱⁱ In the end, he was evicted from his plot and sold his purchase farm. The farm had been invaded by squatters whilst he was in detention. The squatters provided Amos with a continuous hassle impeding successful operation of the farm. Amos left the Nyanyadzi shop to his children, whilst his brother continued farming in Nyanyadzi. Amos himself picked up from his previously successful trade, transporting grain from Gokwe to Rhodesia's urban centres. By 1997, Kombo ran an extensive business empire comprising several shops in Gokwe and Kwekwe, whilst his children were all well educated and employed in the private sector in high profile jobs.

Luc Jambaya: Alvord trustee, plot holder, businessman, no nationalist^{iv}

Luc Jambaya already featured in chapter 5.2 as an example of an Alvord trustee, who resigned from his job as clerk at the Nyanyadzi office to take up irrigation in 1947. By that time Jambaya had experienced a tremendous upward mobility under the guidance of his tutor, and later boss, Alvord. Luc was born in 1912 in Portuguese East Africa, his mother being one of the eight wives of an *Ndau induna* who fought the Portuguese within the ranks of Ngungunyana's army (1895). During the great famine of 1921 his family fled to Mt Selinda mission, where the 10-year-old Luc helped Alvord to dig the first irrigation furrow (at Zona tea estate, Mt Selinda). After enjoying 5 years of Methodist education, Luc went out to work, first as a teacher at a Reserve school, later in a mine in Johannesburg. Upon his return in 1940 he went to see Alvord and was taken on first as a conservation pegger, and later as a staffer at Head Office. After all sorts of odd jobs in the Department's experiment stations and Devuli and Nyanyadzi irrigation schemes, he ended up as the clerk in Nyanyadzi. He was offered an NPA farm, but preferred irrigation, a fact he regretted at the time of the interview. Jambaya married his wife after his return from Johannesburg, paying the *rovora* (bride wealth) from his job proceeds. Both were devout church-going Methodist Christians and stayed in one of the first brick houses along Alvord avenue in Nyanyadzi business centre.

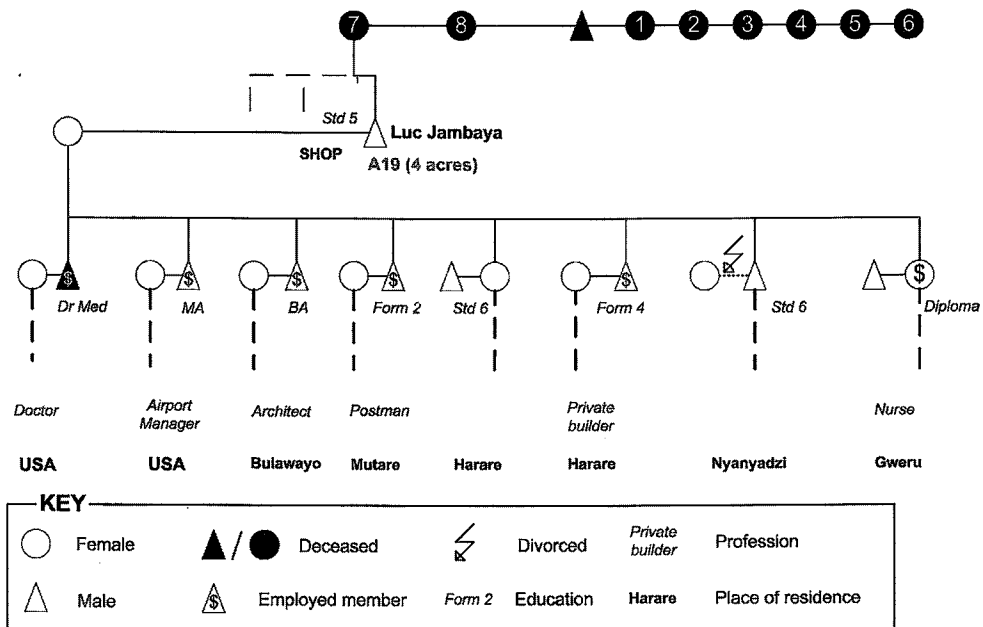
As already noted in chapter 4, Jambaya's employs at his irrigation plot got off on a flying start during the drought of 1947. In 1949 he asked Alvord for permission to start a vegetable garden in his acres. He grew cabbages, paw paws, citrus, mangos and spinach which he sold first at the roadside market in Nyanyadzi, and later at the green market in Umtali. In 1955 Jambaya ventured into piggery, raising some 200 pigs annually, which he sold to the Cold Storage Commission (CSC) in Umtali. He later became one of only two African members of the CSC. Again later, in 1957, he diversified his portfolio by opening one of only five general dealers' stores in Nyanyadzi. He built the store specifically to provide for a pension. In the beginning it was good business, but by 1997 the situation had changed. Luc mainly relied on the proceeds reaped from the cotton, beans and tomatoes grown in his irrigated acres:

'This is my resting-place. I'm not working for a profit any longer. Maybe if I could get a loan from other people. It is difficult now to start a shop on the basis of land (agriculture). Maybe one could start a business now on war pensions.'

Jambaya was not a nationalist leader, though he supported their cause during the war. He supplied food and boots to the *vakomana*. Jambaya regretted the downfall of Nyanyadzi scheme as a factory of agricultural wealth, a loss that was precipitated by the refusal of the plot holders to pay water rates in 1978: 'Even now people in Chitinha (block C, AB) do not pay. The Rhodesian law was better.' Most of the wealth generated by the various agricultural

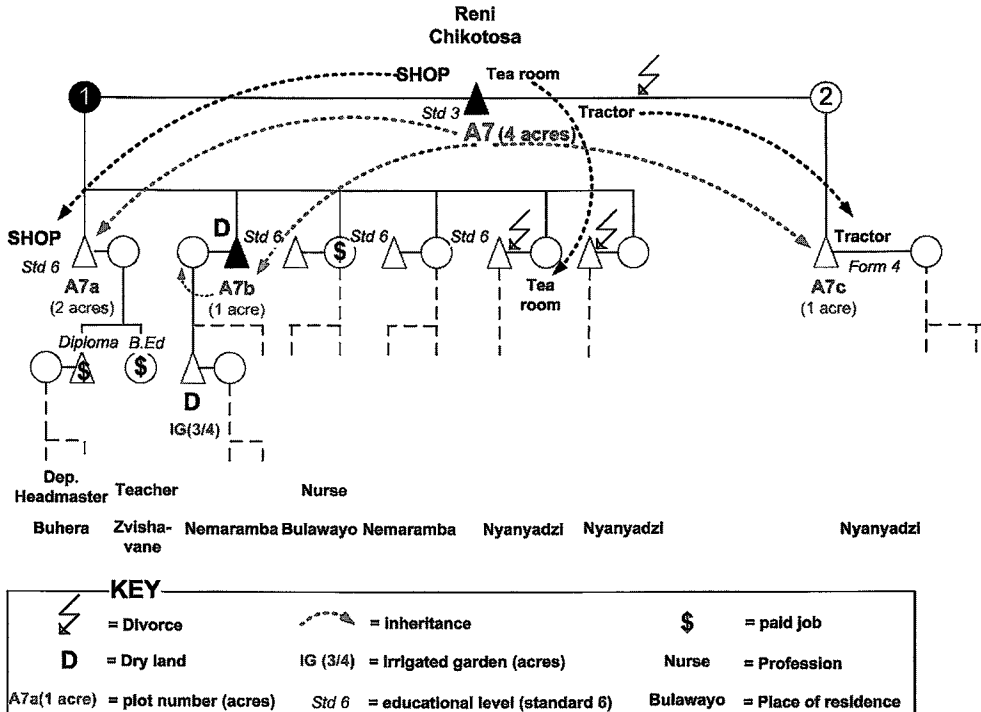
and entrepreneurial employs of the Jambayas was invested in the education of their eight children. As shown in figure 7.1 all children except one son have since left Nyanyadzi and have been gainfully employed in one of Zimbabwe's urban centres and the United States of America. Their careers and educational achievements make up the real wealth of the family. Luc's one remaining worry concerns his youngest son, who wasn't successful at school, divorced from his wife and couldn't get a job: 'He drinks. He won't succeed. I take care of his six daughters.' Despite their old age the Jambayas were still working their four acres of land, assisted by a hired labourer. At the time of the interview Luc wasn't sure yet whether he should pass the plots to his one remaining son.

Figure 7.1: Genealogy of Luc Jambaya, modernist, plot A19



Reni Chikotosa: original plot holder, businessman, no nationalist

The case of Reni Chikotosa provides an intermediate story of capital accumulation that hovers between a traditionalist and a modernist pattern. Reni's father was quite a successful farmer in Mhakwe, some 25 kilometres upstream of Nyanyadzi along the Mhakwe tributary. When he reached the age of adulthood his father sent him to school at neighbouring Rusitu mission (United Baptist Church). After attaining his standard three, Reni went to Johannesburg to earn his *rovora*. Upon his return in 1928, he married his wife at Mhakwe and bought a plough and a bicycle. After a brief attempt to dig an irrigation furrow in Mhakwe, Reni left his parental home and went to Nyanyadzi where he was quite successful in farming in the Odzi river bed, whilst hunting for wild life. In exchange for a full leopard skin, the then NC for Msetseter gave Reni a permanent gun licence. By that time his first son, Joseph was born. From the start Reni invested part of his proceeds in cattle, and this was to be a life-long strategy. At a later stage Reni asked his second son to settle in the Nemaramba area to look after the family's cattle herd.

Figure 7.2: Genealogy of Reni Chikotosa, modernist, plot A7

When Alvord came along in 1934, Reni initially shied away from joining the MuNyanyadzi irrigation scheme. However, by 1937, Reni cleared some four acres of bush in block A and joined the big Nyanyadzi scheme. After some successful years of farming, Reni started a tearoom in a pole and dagga hut under a mango tree, seizing on the opportunities offered by a thriving place like Nyanyadzi. In 1953 he built a general store and tearoom in Nyanyadzi business centre. With help of hired labour Reni built a thriving business. During the 1960s Reni could afford to buy a tractor and trailer, offering ploughing and transport services to Nyanyadzi plot holders. His two eldest sons and two eldest daughters enjoyed Methodist missionary education up to standard six. Joseph, his eldest son left Mutambara mission school in 1951 to start teaching at neighbouring Hot Springs. He briefly tried his luck to train as a nurse in Salisbury, but found he didn't like the job. After attaining his driving licence in 1956, Joseph married a girl from Bocha and got a permanent job as a driver at New Year's Gift tea estates in Chipinge district.

Reni never was an active member of any nationalist party, though he was occasionally picked up by the Rhodesian authorities, which suspected rightly that Reni supported the nationalist cause. His eldest son, however, was an active member of all nationalist parties. During the war, Joseph resigned from his job, after nearly hitting a land mine. Subsequently he settled in Nyanyadzi, helping out his father. After the death of his first wife Reni had married again, but soon after they had a son the two divorced. In 1979 the Police briefly apprehended Joseph, after it was discovered that his father's shop supplied the *vakomana* with food and other items.

Upon his death in 1984, the estate left by Reni was sub-divided amongst his offspring (see figure 7.2). Joseph inherited the shop and two irrigated acres. Joseph runs the shop with his wife, whilst they hire two casual labourers to work the acres. Like his father, Joseph has invested in the education of his two children, who were both professionally employed in teaching at the time of the research. Gideon, the second born, inherited most of Reni's cattle and one irrigated acre, which befell to Gideon's wife upon his premature death in 1994. Enos, the third son, inherited the tractor and the remaining irrigated acre, whilst the tearoom is presently run by Reni's third daughter, who was unfortunate in marriage.

Jena clan: native plot holders, no nationalists

The story of the Jena clan provides a contrasting case of irrigation and capital accumulation that is more in line with an African traditionalist idiom. Mutemute Jena was a local inhabitant in the Nyanyadzi area, even before the European settlers arrived in eastern Zimbabwe. Mutemute practised shifting cultivation in the area North of the Nyanyadzi river, whilst growing rice in the river's wetlands. His son Chimoyo got enrolled in the MuNyanyadzi scheme that Alvord initiated. Chimoyo was subsequently appointed as the *mupurisa* (Chief's police) of headman Nenohwe, who was sceptical of the irrigation venture in his area. Other Jena's were also sceptical of the venture and only joined later, when the original MuNyanyadzi plot holders were offered new plots in block C on the southern banks of the river. Because of the dearth of plot holders in 1943, many original MuNyanyadzi plot holders managed to get hold of separate plots for their wives. The Jena/Chimoyo clan has however maintained its residence at the northern side of the Nyanyadzi river, in the area formerly covered by the MuNyanyadzi scheme, known as Tsianwa. Successive Jena's in the Chimoyo arm of the clan have succeeded Chimoyo as *mupurisas* administering the Tsianwa area on behalf of kraalhead Nyanhanda and headman Nenohwe (see 8.1).⁷

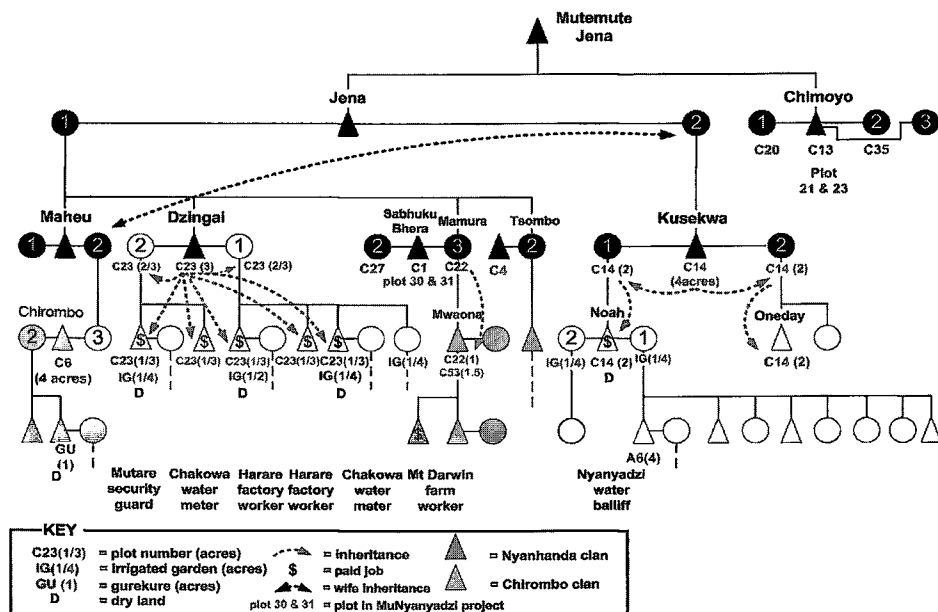
Irrigated agriculture provided the Jenas with the means to accumulate wealth that was used to acquire large cattle herds, which in turn allowed men to marry more wives and families to extend. The availability of sparsely populated dry land in Nemaramba provided some of the non irrigating Jenas (like Maheu Jena, see figure 7.3) with the means to sustain a traditional way of life, whilst the abundance of grazing land in Nemaramba provided the irrigating Jenas with an exit option for their growing cattle herds. As can be seen in figure 7.3, all Jena men folk are polygamist. Many of the members of the Jena clan joined the Johane Maranke independent Christian church that was founded in Bocha (across the Odzi river) during the late 1930s. This Christian movement condones polygamy. The movement provided Africans with an alternative voice protesting against European norms and values espoused by Missions of European denominations, whilst stressing the inherent Africanness to its religious teachings (see Ranger 1985, Daneel 1974). None of the Jenas enjoyed missionary education at one of the neighbouring Mission stations. The trappings of education are only enjoyed by the latest, post-independence, generation of Jenas.

Neither of the Jenas played a role in the African nationalist movement. Rather a cautious strategy of accommodation and compromise with the colonial administration was followed, seeking to secure and sustain an African traditionalist way of life in the face of modernist interventions by Agricolos. The few Jenas that were educated before independence joined the ranks of District Assistants and the British South African Police. Labour migration did occur

⁷ This is an exceptional phenomenon that was precipitated by the special status accorded to the MuNyanyadzi scheme. The present *mupurisa* Isaac Aezeki Jena claims allegiance to kraalhead Nyanhanda, who falls under headman Gudyanga's area in Chief Muushu's land. At the same time Tsianwa, the area Isaac 'polices', falls within the purview of headman Nenohwe in Chief Mutambara's land.

and was valued amongst young men as a means to pay for *rovora* (bride wealth). Yet the jobs that Jenas engaged in were mostly unskilled, in contrast to the jobs modernist sons and daughters of Nyanyadzi irrigators took on.

Figure 7.3: Genealogy of part of the Jena clan, traditionalists, block C



After independence the Jenas and other traditionalists in block C capitalised on the promises made by freedom fighters of free use of land and water to craft the water-network and its surrounding area to suit a variegated portfolio of livelihood pursuits (see below). The fact that the Jenas were polygamist, poorly educated, and numerous has resulted in land pressures in block C and increased sub-division of plots among heirs. For instance upon Dzingai's death his five married sons and two wives all inherited part of the three acres of irrigated land he possessed, leaving them with small acreages. In response the sons and wives have all developed alternative means of gaining a livelihood. All five sons of Dzingai have unskilled jobs in town or European farming areas, whilst they also enjoy access to rain-fed land in Nemaramba. In addition their wives cultivate irrigated gardens along the river. Over time the political fate of the Jenas and other traditionalist clans in block C has become firmly identified with ZANU(PF). None of the block C plot holders claim political allegiance to opposition parties.

The post-independence effects of the war on the Nyanyadzi community

As argued in 5.2 the present day political divisions in the scheme originate from Nationalist party politics during the liberation war. After the conclusion of the internal settlement in 1978, Ndabaningi Sithole and his Nyanyadzi followers were accused of betrayal by the Mugabe-led ZANU liberation army. Some successful plot holders *cum* businessmen were killed in Nyanyadzi by the *vakomana* after being earmarked as sell-outs. The same fate befell some of supporters of the Smith regime, originating from royal families in block C. This resulted in lasting splits within the Nyanyadzi community and more in particular in its

leadership. Whilst some of the old nationalists jumped over to join the ranks of ZANU(PF), others remained loyal to their original leader Ndabaningi Sithole and his ZANU-NDONGA party. The co-operative and the IMC as well as the block IMCs became political arenas where the different factions were promoting their own cause. The traditionalist leaders gradually waned towards ZANU(PF) certainly after it dawned on the ZANU(PF) national leadership that the new local committees (VIDCOs) were ineffective. Traditional leaders became pivotal for the distribution of grain relief packages, used by the party leadership to secure political loyalty.

After the parliamentary elections of 1995, ZANU(PF) held 147 of a total of 150 seats in parliament. ZANU-NDONGA, led by Sithole was the only opposition party, holding two seats in parliament, based on its stronghold in the Save valley (the *Ndau* heart land).⁸ The Nyanyadzi plot holders and leadership keenly exploited their oppositional reputation to wrest more resources out of the government, postponing financial devolution, whilst preventing revival of Nyanyadzi as a government run factory scheme. The two contrasting patterns of wealth accumulation have resulted in different ways of both relating to and making use of the water-network across generations. The next section shows how these accumulation patterns impact on livelihood strategies.

7.3 CROSS-GENERATIONAL ACCUMULATION PATTERNS AND LIVELIHOOD STRATEGIES

In chapter 6 a sobering conclusion was drawn with regard to the financial viability of the Nyanyadzi water-network. The gist of the story of Nyanyadzi seemed to boil down to what Agritex sceptics have always stated: financial devolution had proven to be the litmus test and the irrigators had failed to live up to expectations. However, that would be too easily said. The fact that the Nyanyadzi IMC has not been capable of raising sufficient funds to keep the pumps operational, is in itself not necessarily proof of the farmers' incapability to run affairs on their own. Rather, as will be demonstrated in the remainder of this chapter, it could prove the opposite: the Nyanyadzi irrigators never wanted the new electrical pump station in the first place, since it not only created a heavy financial burden, but also introduced a high degree of dependency on outside agencies for pump repairs in case of a break-down. What has happened in Nyanyadzi over the years can also be interpreted as a process of re-appropriation of the scheme by its politically divided users. Nyanyadzi irrigators are not only different in their political orientation, but also in their religious and cultural orientation as well as their spatial origin. This also brings differences in investment patterns, livelihood strategies and organisational practices employed by succeeding generations of Nyanyadzi plot holders and their offspring, which in turn inform the process of re-appropriation of the water-network and its surrounding environment.

Plot holders and use of the scheme in 1997

The mere existence of these patterns is reflected in the differences in present-day sources of livelihood of the Nyanyadzi plot holders. Table 7.1 presents some differences between block A and C irrigators in terms of average plot holding sizes, sub-leasing practices, ownership of dry land, use of 'illegal' irrigated gardens along the Nyanyadzi river and main canal, unauthorised plot extensions and occurrence and nature of labour migration. In 1997, the scheme and its users had a totally different livelihood orientation than they had during the days of the irrigation factory.

⁸ The remaining parliamentary seat was held by an independent member, who had defected from ZANU(PF).

Table 7.1: Plot holders and sources of livelihood in block A and C

Block	Command Area (ha)	Registered ploth (#)	Actual plot holder (#)	Avg holding (ha)	Sub-leased plots (%)	Dry land access (%)	Irrigated garden (%)	illegal plot access (%)	labour migration income (%)
A	136	123	190	0.72	7%	5%	0%	n.a.	n.a.
C	65	67	159	0.41	4%	58%	69%	12%	28%

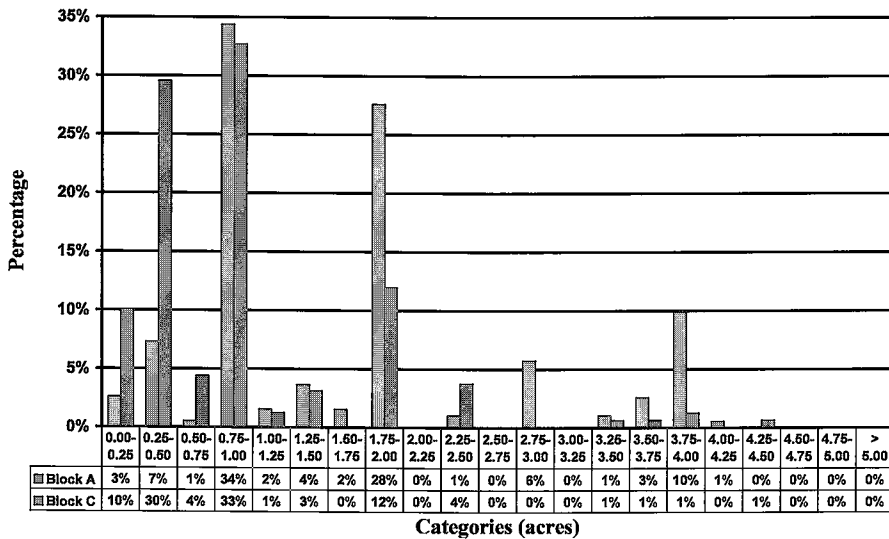
Source: Plot surveys, Bolding, May-July 1997

Table 7.1 challenges the official myth of the scheme as perceived within Agritex circles and the majority of academic and consultancy reports that base themselves on official data.⁹ It shows that the average plot holding considerably deviates from the official reality (1.11 ha in Block A; and 0.97 ha in block C) and that these also differ markedly between blocks A and C. Whereas the average block A plot holder has almost two acres of irrigated land at his/her disposal, in block C access to irrigated land is limited to a mere acre. In 1997 the official plot register kept by Agritex contained the names of 44 deceased plot holders (36%) in block A and 23 deceased plot holders (34%) in block C. In addition in block C a majority of plot holders has access to an irrigated garden, mostly situated along the Nyanyadzi river, and a piece of dry land to practise rain-fed agriculture, located both in the direct vicinity of the block and across the river in the area known as Nemaramba (see map 7.1). Some 28% of all plot holders of block C have a member of the family gainfully employed elsewhere and 12% has access to 'illegal' irrigated plots inside the block. The latter are locally known as *gurekures* (literally: long, small plots) and can be found both inside and along the edges of the irrigated command area. Illegal extensions of the command area can also be found in blocks A, B and D, particularly near drains inside and along the edges of the blocks, but are not as numerous as in block C. In addition block C plot owners possess larger cattle herds than the irrigators in block A.¹⁰ During the winter season of 1997 some 7% and 4% of all irrigated plots in blocks A and C respectively had been sub-leased to both insiders and outsiders of the Nyanyadzi community.

Graph 7.1 shows the sharp differences in plot holding distribution between blocks A and C. Whereas in block C 40% of all plot holders own half an acre (0.2 ha) or less of irrigated land with a minority (22%) having access to more than one acre (0.4 ha), in block A only 10% owns half an acre or less with a majority of plot holders (55%) cultivating more than one acre. These differences can not be ascribed to a different starting position, as shown in table 7.2. In 1957 the average plot holding in block C (1.2 ha) exceeded that of block A (1.0 ha). Despite similar rates of growth of the command area the difference in access had reversed between block A and C in 1997. Another trend reverse concerns the number of female plot owners. Whereas women control an increasing share of plots in block A, in block C their share of irrigation plots has fallen.

⁹ The socio-economic survey data produced by Mary Tiffen and her team of researchers (see Tiffen 1990a, b; Tiffen and Glaser 1990; Tiffen *et al.* 1990) bore little resemblance to the empirical reality of Nyanyadzi and its inhabitants, but reproduced the official beliefs held within Agritex circles. This is particularly unfortunate considering the widespread influence that this research had on debates on plot sizes and viability of farmer management in smallholder irrigation.

¹⁰ The exact size of livestock holdings were not established in the 1997 survey, but CSO estimates provided by local Agritex staff show a consistently higher number of oxen, cows, heifers and poultry in possession of block C plot holders than in block A. CSO data for the 1992-93 season show a total herd of 226 heads of cattle in block A and 257 heads in block C, which harbours less plot holders. In terms of goats block A and C are at par.

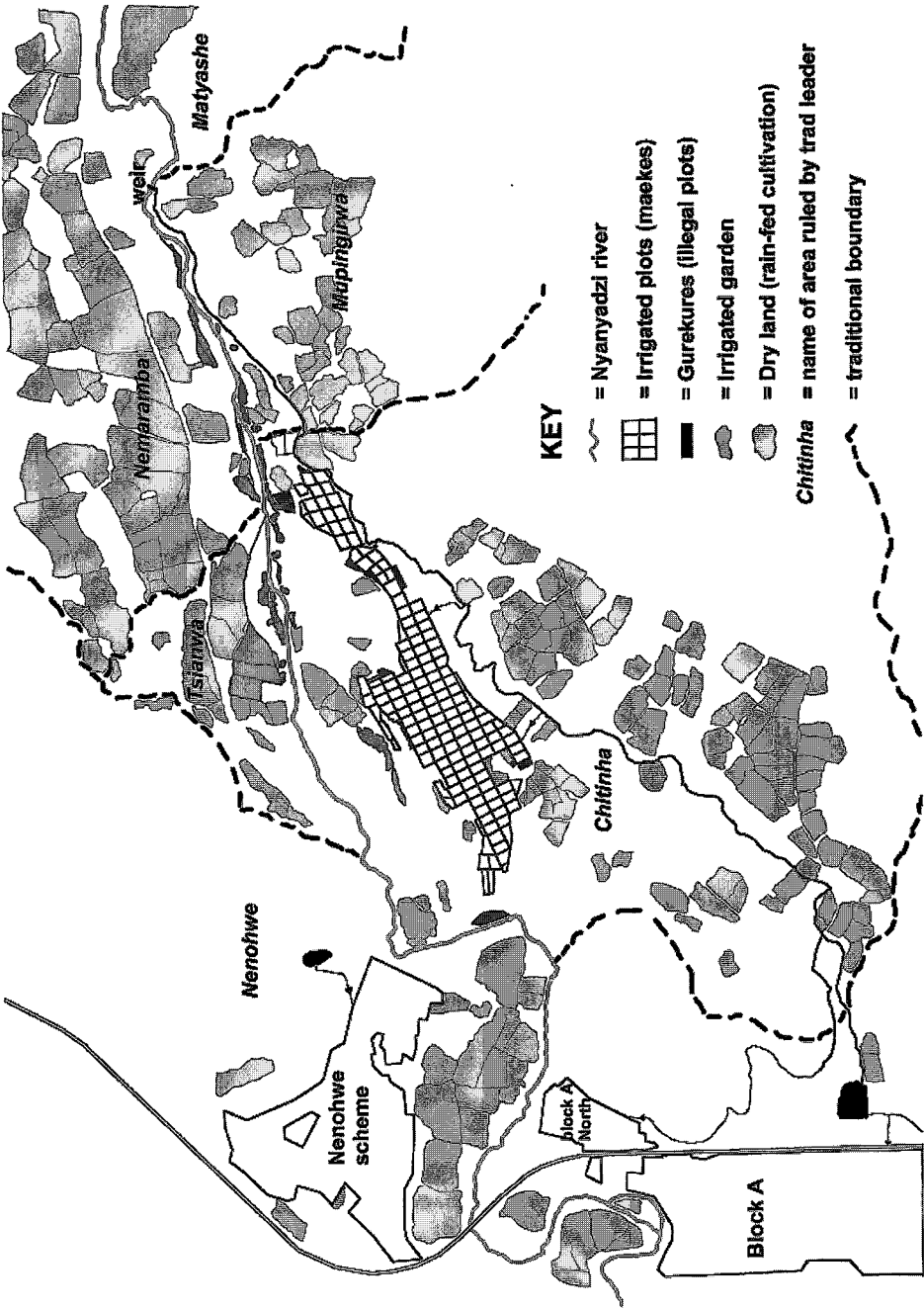
Graph 7.1: Plot size distribution: block A and C compared for 1997**Table 7.2: Changes in plot ownership from 1957 to 1997 for block A and C**

Feature	Block A			Block C		
	1957	1997	% change	1957	1997	% change
Total size block (acres)	254.5	342.3	+ 35	129.5	163.5	+ 26
Number of plot holders	99	190	+ 92	42	159	+ 279
Average plot holding (acres)	2.57	1.80	- 30	3.08	1.03	- 57
Percentage female plot holders	22.2%	24.2%	+ 2	35.7%	23.9%	- 11.8

Sources: Hunt (1958, 12) for data on 1956-57 season; Block A & C surveys for data on 1997 season.

As will be argued in the remainder of this section, these poignant differences between blocks A and C can be attributed to the predominantly modern, Methodist orientation of block A plot holders and the mostly traditional orientation of block C inhabitants. Yet the distinction is subtler than that. Other factors play a role, notably the availability and mobilisation of different cultural, religious, and political repertoires, and the origins of the various plot holders. The use that is made of irrigated plots and the development of alternative livelihood options impinges on how these different repertoires or idioms were shaped across generations, in close interplay with physical characteristics of the area and changes in type and extent of control exerted by the scheme's management. First, attention is paid to different patterns of inheritance and investment that can be observed in block A and C, and the effects these have produced in terms of plot sub-division, gendered access to irrigation plots, mobilisation of agricultural labour (family or hired), type and nature of labour migration and crop patterns. Next, it is shown how the autochthonous, traditionalist community in Chitinha (block C) has recursively aligned the water-network and its surrounding area to accommodate a growing number of inhabitants operating within a limited number of inter-married lineages. In contrast, block A plot holders originate from many unrelated lineages, mirroring the situation in blocks B and D. They rely mainly on commercial irrigated production, whilst their offspring depends on livelihoods that are generated outside the scheme. Finally some brief observations are presented on the phenomenon of plot leasing and the kind of people who engage in plot renting.

Map 7.1: Block C and its surrounding area (1997)



Differences in inheritance and investment patterns: the effects of modernity

The survey of plots and their actual use in blocks A and C included a reconstruction of the inheritance pattern that connected the contemporary users of 1997 with the original plot holder, across several generations. This exercise produced a multitude (hundreds) of inter-linked genealogies often dating back to the generation that preceded that of the original plot holder.¹¹ In the case of block C many contemporary plot holders were related to each other, producing in the end a limited number of core lineages that comprised mostly autochthonous inhabitants of Nyanyadzi. These had been involved in the first MuNyanyadzi water-network that Alvord initiated in 1934. In block A a greater variety of separate lineages was unearthed, mostly involving kinsmen that originated from areas outside Nyanyadzi with a bias towards neighbouring Chipinge district. Very few original plot holders originated from Nyanyadzi itself. Even the traditional leadership predominantly originated from Gudyanga ward, South of Nyanyadzi.

In the structure of the lineages sharp differences could be observed for blocks A and C, not only with respect to the degree of inter-marriage between lineages, but also with regard to marriage practices. Whereas a majority of families in block C was polygamous, sometimes involving one husband married to five wives organised in an extended family with individual grain bins, the majority in block A fell within the category of monogamous nuclear families. In terms of religious affiliation most block A plot holders and their families subscribe to a European mission denomination, with a large Methodist following, whereas the majority of block C users is member of one of the so-called African independent churches (Johane Maranke, Apostolic Faith, ZAOGA). These differences are to some extent reflected in the plot inheritance patterns.

In the event of the death of the male plot holder of four acres the most common pattern of inheritance is that one acre remains with the widow, often co-managed by her eldest married son, whilst the remaining acres are split amongst the married sons in order of seniority. In case the deceased was polygamous a second or third widow also acquires an acre. When next the senior widow dies, her plot reverts to the oldest married son. In case there is no son, the oldest married son of the second widow may claim the plot, or in exceptional cases a daughter may inherit the plot.

Yet, sharp deviations in inheritance patterns can be observed between block A and C plot holders (as shown in figures 7.1 to 7.3). In block A the wife of a male plot holder may get a share of the plot holding registered in her own name even before the death of her husband (see table 7.3). Equally sons may register part of their father's plot holding in their name before he dies. In case the sons are professionally employed and resident in town, daughters may get hold of the plot. In general the inheritance pattern among modernists in block A is informed by a concern to maintain a viable holding. Thus the plot is inherited by one or two married sons, rather than sub-divided amongst all married sons. A recent phenomenon, which has been precipitated by the AIDS pandemic, is that the plot reverts to the uncle, son-in-law or father, because of the early death of the son and his wife.

¹¹ In some cases the lineage-based track did not lead to the original plot holder, e.g. in case the plot holder had been evicted and the plot re-allocated to a member of the lineage that provided the contemporary entry point. In other cases the lineage trail led straight back to the list of original plot holders of the MuNyanyadzi scheme in 1935.

Table 7.3: Contrasts between blocks A and C in plots registered/controlled by women

Status	Block A (n = 46)	Block C (n = 38)
Widow	65 %	92 %
Wife	13 %	
Wife of brother	2 %	
Sister	2 %	
Daughter	11 %	8 %

Source: plot survey, June-July 1997

In block C sons only gain control over plots after the death of the family patriarch. The same goes for married wives (see table 7.3). Newly wed sons may, however, open up 'illegal' plots (*gurekures*) along the edges of the irrigated command area or alternatively open up new rain-fed land either in the area surrounding the block or across the river. In block A the opportunities for opening up new (irrigated) land were limited. The on-going sub-division of plots in block C has led to a situation where the heirs can no longer make a living of irrigated agriculture only. Thus young married couples have diversified their livelihood portfolio opening up irrigated gardens along the Nyanyadzi river, engaging in circulatory labour migration, and practising rain-fed agriculture on dry land in both Chitinha and Nemaramba. Access to the latter category of land is mediated by autochthonous claims of belonging to the place. Allocation of such land is done by kraalheads. The same pattern can be observed among polygamist royal families in block A, though the opportunities to engage in rain-fed agriculture have been limited to the area south-east of Nyanyadzi business centre.

Among modernist plot holders in block A a net out-migration of offspring from Nyanyadzi to urban centres has occurred. The educated sons and daughters of the first and second generation of modernists were well poised to do so at the time of Independence, when relatively few Africans were highly trained, except those who had enjoyed access to missionary education. Thus instead of circulatory labour migration, block A offspring has been engaged in permanent migration with their families to Zimbabwean towns or even as far afield as the United States of America (see figure 7.1). The same phenomenon can be observed amongst modernist irrigators in blocks B and D. The remaining plot holders are often supported by their urban kin in the form of the provision of seed, fertiliser and other agricultural inputs as well as the payment of school fees for the offspring of brothers and sisters that have remained in Nyanyadzi.

Re-aligning the network: contrasts between clan based lineages and nuclear families

The differences across generations in inheritance patterns, marriage practices, educational levels, cultural repertoires and insider or outsider status have informed the ways in which block A and C plot holders have re-appropriated and re-aligned the water-network and its surrounding area.

Irrigation in block C is a lineage based activity, whereby ancestral claims of ownership of the irrigated command area and its environment combined with increasing population pressures have led to a re-appropriation of the water-network as a community scheme for the autochthonous population. By means of on-going intermarriage between a limited group of original lineages a firm network of clans has emerged, that is dominated by two royal families: that of Jena (see figure 7.3) and Nyanhandu. These two clans alone possess 24% of all irrigated acres in Block C. Together with 16 other inter-married clans, they possess 80% of the irrigated plots, 100% of the illegal plots and 56% of all irrigated gardens. The remaining 13 minor lineages and two institutional actors (Chitinha school and St Patrick's Mission) own the rest of the irrigated acreage. A lack of significant out-migration from the

area has led to increased pressures on the land, precipitating the emergence of a variety of livelihood pursuits. Basically four types of land are available to block C residents: *maekes*, *gurekures*, irrigated gardens, and rain-fed land.

Maekes

A majority of the irrigated acres (75%) is in possession of male plot holders, of who one third is engaged in circulatory labour migration in order to make ends meet. Thus it is mainly the women that work the irrigated land, whilst their control over irrigated plots has suffered from the patrilineal inheritance practice. The small plot holdings are mainly (98%) used to grow maize in summer to meet subsistence needs, whilst in winter the dominant crops are tomatoes and to a lesser extent beans (see table 7.4). The tomato crop provides the bulk of the cash income that is generated from irrigated agriculture. Another lucrative crop that is used both for relish and local sale on the green market is onions. During the growing season onions provide the plot holders with a steady source of petty cash. In years that the Nyanyadzi river allows a third season, wheat is planted in almost half the command area, to provide for flour to bake bread. Members of the family provide almost all labour that is used in the irrigated acre. School going children often help out during peak times (harvesting). The newly opened up acres in Nenohwe irrigation scheme have provided some relief to existing pressures on irrigated land in block C. Some members of the Nenohwe and Jena¹² clans have had a chance to settle on this new scheme, north of Nyanyadzi.

Table 7.4: Cropping patterns in blocks A and C, winter season 1997

Crop	Block A (%)	Block C (%)		Irrigated gardens (%)
	<i>maekes</i> (n= 137 ha)	<i>maekes</i> (n= 65.4 ha)	<i>gurekure</i> (%) (n= 2.2 ha)	
Beans	77.7	32.4		3.3
Tomatoes	10.7	52.6	88	19.4
Wheat	5.1	5.0	10	
Onions	0.3	4.5		4.5
Vegi's (okra, cabbage, sweet potato)	2.2	1.0	2	36.4
Mango	0.7	0		
Cotton	1.6	0		
Fallow	0.8	1.8		33.2
Prepared	0.4	2.7		3.1
Leased	7.4	4.3	3.6	0

Source: plot survey, June-July 1997

Gurekures

Gurekures vary in size between a quarter and one acre (0.1-0.4 ha). They have been established at the edges of the command area in places where the local landscape allowed extension of the irrigated area. In some cases labour intensive bench terraces have been constructed to allow for gravity irrigation. In total there are ten such added plots (see map 7.1), of which six are in possession of members of the royal Nyanhanda clan. All users are members of one of the irrigating clans and have access to limited acreages in numbered plots or none at all. Two are women, a widow and a wife, whilst the others are newly wed men that seek an irrigated basis for their livelihood. The *gurekures* are used as if they were ordinary plots, both in terms of crops grown, sub-letting arrangements and irrigation watering

¹² For instance the oldest married son of Noah Jena got access to four acres of irrigated land in Nenohwe (figure 7.3).

practices. The water bailiff for block C, Noah Jena, allocates water to these plots and their owners in the same manner as the numbered plots.¹³

Irrigated gardens

In addition a string of irrigated gardens are operated along both the Nenohwe and Chitinha banks of the Nyanyadzi river (see map 7.1). These vary in size from one eighth of an acre (0.05 ha) to two acres (0.8 ha), and are irrigated with help of hand dug furrows (20%) or buckets (80%). The gardens are mainly controlled by women (68%), though men tend to control the larger acreages. Traditional leaders allocate the area where gardens may be established. As a consequence the majority of the gardens is controlled by members of the Nyanhanda and Jena clans. A minority of gardens (18%) is possessed by non-irrigators. The number of gardens has increased tremendously after the 1992 drought. The gardens are mainly used for growing relish crops, supplementing the daily diet. During the hot season, preceding the wet season, gardens are used to grow green mealies (early maize). For many women the gardens provide a source of food security and petty income. Vegetables grown during the winter season, are sold at the local market place and amongst relatives and friends. Kraalhead Nyanhanda operates the biggest garden that is irrigated from an earth dam and private spring, which is claimed to be perennial. The biggest irrigated venture involves the old MuNyanyadzi canal, which was jointly re-opened during the 1983 drought by an in-law of one of the leading irrigating clans in block C and the present *mupurisa* of the Jena clan (see Photo 13).

Rain-fed cultivation on newly opened up dry land

Increasingly young married members of the irrigation clans have resorted to rain-fed cultivation to eke out a living in the water-network's precarious environment. Access to such land is mediated by five traditional leaders that administer different parts of the surrounding area of block C (see map 7.1). Gradually, all arable land along the main canal, around the irrigated command in Chitinha, and across the river in Tsianwa, Nemaramba and Nenohwe has been taken up. Sorghum and millet are the main crops grown in these areas, though crop failure is experienced in two out of every five years. Women mainly provide the labour for these undertakings. Only during good rainfall seasons does rain-fed cultivation make a meaningful contribution to food security.

Modern nuclear families in blocks A, B and D

In contrast to clan based irrigation as practised in block C, modernist irrigators in blocks A, B and D have been responsible for a substantial out-migration of their offspring from Nyanyadzi to the urban centres of Zimbabwe. Irrigation has been predominantly used by the original plot holders as a springboard to launch the next (educated) generation onto an urban professional career.

Those remaining in Nyanyadzi are more committed and better positioned (due to larger plot holdings) to a commercial type of capital intensive, high input agriculture than the irrigators of block C. In many instances block A plot holders receive assistance from their urban offspring in the form of fertiliser, seed and agricultural implements. The predominance of a commercial view towards irrigation is also reflected in the cropping patterns. During the summer season at least 15% of all irrigated plots in block A are devoted to cotton rather than maize. In the winter season differences in commercial orientation with the block C cropping pattern are less pronounced. The preferred cash crop is beans for two reasons. First, beans do

¹³ The only difference is that the water bailiff doesn't report on the irrigation of these plots to Agritex.

not perform well on the sandy soils of block C, and therefore tomatoes are preferred there. Second, the bean crop requires less labour and its marketing is less risky than tomatoes, which perish fast once picked from the field. The degree of collective action required to carefully time the picking of tomatoes and arrival of a company truck has precluded block A plot holders from entering this lucrative business. During the winter season of 1997 slightly more vegetables were grown in block A than in block C (table 7.4). This is mainly due to the fact that none of the plot holders in block A have access to irrigated gardens along the river. Most of the dry land surrounding blocks A, B and D has been taken into cultivation, just like in block C. But contrary to the situation in block C, it is not the plot holders but outsiders who occupy these stretches of rain-fed land, except for plot holders of royal lineages. The traditional leaders of blocks A and B mediate access to this land. Besides allocating it to their own kinsmen they have mainly issued land to outsiders who are gainfully employed at the scheme (seasonal labourers as well as teachers).

In terms of household structure the post-independence out-migration of family members has allowed a sustained dominance of the nuclear family amongst block A plot holders, particularly amongst modernist families. One of the effects of the out-migration is that gradually more rather than fewer women got access to irrigated plots. The fact that most of these modernist families originate from a different place than Nyanyadzi and do not share the same level of intermarriage as autochthonous plot holders in block C, has limited the scope for collective action in blocks A, B and D. Most Methodist plot holders yearn for the loss of state tutelage of the scheme as a consequence of neo-liberal adjustment policies. They regard the scheme as different from communal areas and deplore the nascent influence of the traditional leadership in block C over the scheme.

Irrigation and business: volatility and bonded labour

Over time the more successful modernists have engaged in a variety of commercial enterprises. Business activity in Nyanyadzi has been subject to both long and short-term fluctuations, depending on the opportunities the scheme offered to make money and the seasonal water supply respectively.

Present day Nyanyadzi harbours two major business centres, both located along the main Mutare-Masvingo road. In total 66 official business ventures were operated in 1997, of which three had closed shop due to low business.¹⁴ In addition a great variety of unofficial businesses was undertaken at roadside market stalls and in back yards of official shops at the main shopping avenue. These informal business ventures are mainly undertaken by unemployed youths and seasonal labourers from neighbouring dry land areas. Of the official ventures the majority (58%) was owned by plot holders, mainly originating from blocks A and B.¹⁵ Of these plot holders *cum* businessmen most had established their shop before independence by using agricultural surpluses generated on the plots. In most cases business had reached a peak during the 1980s, and tapered off during the 1990s. In 1997, 60% of these plot holders *cum* businessmen depended mainly on irrigated production for their livelihood. About half uses family labour in the shop and plot, whilst the other half employs hired labour to work the plot, the shop or both (see box 7.1).

¹⁴ A survey of official shops was undertaken in June-July 1997. The 66 business ventures comprised 34 general dealers stores, 7 butcheries, 7 grinding mills, 4 bottle stores, 2 eat houses, a bakery, a supermarket, a hotel, 2 fashion stores, a hardware store, 2 carpentry workshops, 3 hair saloons, and an art shop.

¹⁵ Block A plot holders owned 19 shops, block B 15, block D 3, and block C 1 (kraalhead Nyanhanda). The common order of acquisition was to first have a plot and then establish a business (80%).

One third of all shops was rented out to fifteen different people comprising three sons of plot holders, three national companies, four professionally employed persons, four businessmen not native to Nyanyadzi that ran regional chains of shops and one wife of a soldier who used her husband's war veteran pension to run three shops in Nyanyadzi.

Box 7.1: Hired labour in Nyanyadzi, the example of Nelson Rudes^{vi}

Nelson Rudes^a is a fifteen-year-old boy from Gudyanga (dry land area to the South of Nyanyadzi). One day I met him tending a herd of goats in the area behind the Night Storage Dam. He told me the goats belonged to Mrs Kundhlande, a block A irrigator. Nelson himself was one of a family of eight. His mother stayed in Gudyanga working eight acres of rain-fed land, but the family could not cope with the arid conditions. Nelson's father worked in South Africa in the mines. Nelson himself was employed by the Kundhlandes for a monthly salary of Z\$80 plus food and living quarters. Nelson undertook the cultivation of the three acres that were controlled by the widow, son and wife of the son respectively. The work entailed all major activities, i.e. ploughing, sowing, and harvesting. Nelson also arranged for the irrigation gifts through one of his uncles who happens to be water bailiff. Nelson did not get a share of the yield.

The business of irrigation: plot leasing and plot sales

The practice of plot leasing allows further flexibility in the use of the plots by both plot holders and outsiders. Thus the water-network caters for a greater group of beneficiaries than the plot holders and their relatives. Plot leasing only occurs during the winter season, when remunerative crops like beans and tomatoes are grown. Payment for the lease depends on the type of crop and number of bunds involved. Charges are made per bund, or *dhunduru*, whereby a one-acre plot normally consists of 18 bunds or border strips.¹⁶ The going prices during the 1997 winter season varied from Z\$40-50 per bund of beans and Z\$40-45 per bund of tomatoes.¹⁷ However, payment is not always done in cash. Sometimes free ploughing services are offered to the lessor in exchange for the cultivation of a couple of bunds. Share cropping does not occur in Nyanyadzi. The renter pays for the use of the plot and may reap all the benefits, whilst arranging for all inputs and labour him/herself. The practice of plot leasing is more numerous in block A than in Block C confirming different degrees of land pressure.¹⁸

Those who offer (parts of their) plots for lease do so for different reasons. Some are absentee landlords or plot holders who have no time to look after their plot since they are professionally engaged elsewhere (either in town or in Nyanyadzi itself). Others cannot mobilise sufficient labour or capital to cultivate their entire land holding with labour and inputs consuming crops like tomatoes and beans. For instance in block A a widow whose four

¹⁶ The concept of *dhunduru* is tied to the technique of border strip irrigation. It provides an example of how the technical-spatial organisation of the water-network is linguistically expressed, whilst at the same time espousing new concepts. The problem is that the concept of *dhunduru* is not very exact as a spatial surface indicator. The area covered by a *dhunduru* depends on the geometrical dimensions of the plot. The typical square shaped plots that Alvord associated with progress comprise 18 border strips. Other plots, notably those at the edges of irrigated blocks, may be more longitudinally shaped and as a consequence comprise up to 24 border strips that are shorter in length and cover less area. In other irrigation schemes, which do not employ the border strip irrigation technique (e.g. Tawona), irrigators also refer to land area in terms of *dhundurus* (Vijfhuizen 1998).

¹⁷ These charges amount to Z\$1800-2250 (US\$130-160) per hectare of beans, and Z\$1800-2025 (US\$130-145) per hectare of tomatoes.

¹⁸ The scarcity of irrigated land in block C has not led to the emergence of a land market, because of an abundance of family labour and small size of the plots. In block A a combination of relatively large plot holdings, high levels of out migration (scarcity of family labour) and old age of plot holders has resulted in more plot leasing.

sons all worked and lived in towns could only muster sufficient labour to cultivate one of her three and a half acres. In other instances entire plot holdings are leased out by those who are interested in or in need of cash to pay school fees or other outstanding commitments. In two cases in block A entire plot holdings were leased out, since the young heir was not interested in agriculture. In another block A case a plot holder sub-letted his whole holding, whilst leasing another plot for himself. The latter plot was better situated in terms of water supply, offering a better opportunity to reap a good bean crop.

Those who hired plots comprised a mixed bag of people. In the 1997 winter season a total of 39 different people and one institution (the Methodist Church) hired plots, comprising 14 women and 25 men. These concern both insiders and outsiders to the water-network, though all share some form of attachment to the Nyanyadzi community. In numerical order the renters comprised local businessmen, who worked the plots with the help of hired labour; non-irrigators who were professionally engaged in Nyanyadzi (teachers, craftsmen, a nurse, a bus inspector); unemployed women like divorcees with kids wanting to earn money to pay school fees or widows whose husbands had been professionally engaged in Nyanyadzi; daughters and sons of plot holders who did not have access to (irrigated) land; and two cases of plot holders that wished to expand their irrigation operations capitalising on available labour force (see box 7.2).

Box 7.2: Zebedia Gudyanga, Nyanyadzi's biggest agricultural entrepreneur^{vii}

An example of an agricultural entrepreneur who also happened to be the biggest renter of plots in Nyanyadzi is the Methodist businessman *cum* plot holder Zebedia Gudyanga. Zebedia, who is locally known by the nickname of *Tsotsi* (thief), is related to headman Gudyanga and acquired four acres in block A in 1952, after enjoying four years of Methodist education at Mutambara mission station. Over time he used his proceeds from irrigated agriculture and his job as bus driver to establish a network of four shops and a bottle store in Chipinge district, whilst marrying a total of six wives to take care of his agricultural ventures. Whilst Tsotsi possessed a keen entrepreneurial spirit commonly associated with Methodist individualism, he firmly adhered to a polygamist orientation that is commonly associated with African royal traditionalism. His comments on the apparent incongruence of his devout Methodism and polygamist status were that:

'They (the church, AB) don't want me to have six wives. But I want Jesus only and not these church people.'

During the 1997 winter season, Tsotsi, his wives and daughters rented a total of two acres (0.8 ha) of land in block A from five plot holders. In addition Tsotsi and his family hired another five acres (2 ha) in blocks B and D. Tsotsi is a master farmer, but his wives and offspring undertake most of the agricultural work.

The practice of plot leasing is not without risks. One block A plot renter changed the name in the plot register into his own after paying maintenance fees at the local Agritex office (see also 8.3). In other cases plots are sold at the plot holder's own will. In block A there were two known cases: one involves a widow who sold one acre to a resident plot holder and another involving a plot that was bought by the wife of a ZANU(PF) *chef*.

7.4 CONCLUSION AND DISCUSSION: A CROSS GENERATIONAL PERSPECTIVE

In this conclusion the observed cross-generational idioms of accumulating wealth in Nyanyadzi are highlighted. Thereafter the implications of such a cross-generational perspective for policies on plot size, conceptions of settler households and its economics and livelihood dynamics are discussed.

A cross-generational perspective: two idioms of accumulating irrigation wealth

Basically two cross-generational patterns can be discerned that had a differential impact on the ultimate political and economic influence/wealth that was generated within the first and succeeding generations and informed subsequent modes of using the scheme and organising its management.

Firstly there are the traditionalists and independent African church followers with a polygamous orientation. These 'invested' mainly in women and cattle. Some of their children went to war. Most of them, though not all, have not made it economically. Plots had to be sub-divided amongst many children and spouses and currently are mainly used to provide for subsistence income. Almost all originated from Nyanyadzi and took part in the first MuNyanyadzi scheme. The majority of these people can be found in block C and the core of them is formed by a limited number of inter-married kinship lineages, of which the local kraalhead and IMC member forms the leading one. Their political stakes are in the traditional leadership and ZANU(PF). Their offspring has not been well educated. To make a living they depend on labour migration in unskilled jobs in nearby towns.

Secondly there is a large group of Christian (mostly Methodist) modernists. Most of these people reside in blocks A, B and D and originate from outside Nyanyadzi. These invested in the education of their children, were educated themselves (teachers who took up irrigation) and also invested in various business interests. Some of them were at the forefront of nationalist politics during the period of open African Nationalism (1958-1964). Many of their children joined the war effort. However, after 1978 some of them had to bear the brunt of sell-out hunting, since most of them remained loyal to their NDONGA leader. Their children and grand children, however, were highly qualified at independence and found lucrative jobs in Harare and other urban centres.

Policy relevance of a cross generational perspective

Relatively few studies on smallholder irrigation adopt a cross-generational perspective. This is surprising considering the attention paid to the issue of economically viable plot sizes by planners and design engineers not only in the Zimbabwe, but also internationally. Within Zimbabwe the debate on plot sizes has been tied in with debates on the purpose of irrigated production (subsistence versus commercial) and the role of irrigation in the livelihood portfolio of the users (full time irrigation versus combinations of wet and dry land cultivation). The post-independence *comma-hectare* schemes had small plots (less than 0.2 ha) and were meant to improve food security of rain-fed farmers. Yet most of the new schemes aim at commercial, full time irrigators with plot holdings in the range of 1.0 to 2.0 hectares (Rukuni 1988, 8-9; Chitisko 1995, 32). Contributors to the debate often suffer from a 'snap-shot' approach: none of the studies engages with the question what happens *after* the plots have been allocated to the initial group of plot holders.

Comparison of plot sub-division and re-appropriation at block C with the Moulelela scheme

One exception is a study on the Moulelela scheme in Niger by Norman (1998). The size of the Moulelela scheme is comparable to block C in Nyanyadzi (65 hectare), yet the lifespan of Moulelela is shorter (it was started in 1967). The agro-ecological conditions of both schemes are similar (annual rainfall between 200-550 mm and sandy soils) and the irrigation plots of both schemes were issued to the original inhabitants. The management regimes can in both cases be characterised by a trend from strict supervisory control to a gradual relaxation and more room for farmer autonomy during the 1980s and 1990s. In 1974 one third of the plot holders in Moulelela were evicted from their plots on account of failure to pay tax arrears. The

vacated plots were issued to family members. In both cases the scheme has been gradually re-appropriated by its clan based users. Due to ongoing sub-division of plots the average plot size decreased with 37% in Moullela in the period 1967-1996, whilst in block C a decrease of 57% occurred between 1957 and 1997. In both schemes plot holders engage in rain-fed cultivation, growing sorghum and millet on rain-fed land in the area surrounding the scheme. During the dry season some plots may be sub-leased to non plot holding family members and outsiders in exchange for cash payments. Where block C differs is that many plot holders, in particular widows and wives, have access to an irrigated garden along the river. Norman (1998) does not report of such gardening in Moullela.

The similarities between Moullela and block C bring out the dimensions of the re-appropriation of a water-network along the lines of a traditional African idiom. Norman (1998, 180) attributed the flexibility and fit between the scheme's management and use with its socio-economic environment to the limited scale of the scheme. In Norman's view the clan based sub-division of plots had prevented the emergence of social and economic stratification among the users of the water-network. And indeed the same observation could be made for block C. With regard to the matter of minimum plot sizes, Norman (1998, 174) suggests to learn from African indigenous practice, observing a minimum plot size of 0.10 to 0.15 hectares in indigenous irrigation furrows. Once that threshold has been reached, plots are no longer sub-divided, but rotated amongst the heirs or alternatively held in communal ownership by heirs. In block C the threshold lies slightly lower (0.05 hectare), though communal ownership of plots by heirs was also increasingly being practised.

The comparison between Moullela and block C also brings out the unique anomaly presented by modernist plot holders in blocks A, B and D in Nyanyadzi. The deviant pattern of plot sub-division and sustained emphasis on full time irrigation farming by those who have not migrated to towns may be the combined result of the modernisation efforts of Alvord, missionary education, and immigrant status of these plot holders. The availability of alternative cultural, religious and entrepreneurial repertoires as well as the opportunities offered by an expanding urban and industrial sector may have affected the sustained prevalence of full-time irrigation farming in other schemes as well. Yet there are other dimensions to the matter of accumulation, sub-division, and widening of livelihood options that impinge on contemporary policy debates.

Opening the black-box of the household, its economics and labour management strategies

Many studies assume conceptualise the household as a male headed nuclear family, reproducing the official image of the plot holder featuring within the managerial realm. When combined with a uniform economic model that calculates the costs and benefits of irrigation according to official market prices and doubtful official statistics on cropping patterns and yields, a picture emerges of the importance and viability of smallholder irrigation that is completely divorced from the reality on the ground (*cf* Tiffen 1990a&b, Rukuni *et al.* 1994). This chapter and the work of Vijfhuizen (1998, 2003) and Mate (1996) on the gendered nature of irrigated production and the commoditisation of irrigated produce in Tawona irrigation scheme has shown some of the intricacies of the production and marketing process as well as the differences in mediation of access to land, labour and crops amongst plot holders of different generations, sexe, and cultural dispositions.

Vijfhuizen (2003, 210-15) highlights the complex interactions involved in the valuation of 200 kgs of groundnuts grown on 0.08 hectares of irrigated land by one wife from a nuclear family of ten (eight children) in Tawona irrigation scheme. Of the transacted produce 22%

was used to pay for labour, 22% was consumed by household members at 13 different occasions, 13% was given away to mostly members of the patrikin in appreciation of gifts received earlier, 2% was bartered in exchange for vegetable seeds, 34% was sold to both villagers and hawkers from outside the village and 7% was kept as seed for the next season. Vijfhuizen (1998, 2003) argues that the valuation of crop produce is a lot more complex than officially recognised. The ground nut production undertaken by female irrigators in Tawona is not even officially recorded. Its value to different members of nuclear and polygamous families is overlooked. The limited official understanding of intra- and inter-household production and marketing strategies leads to an underestimation of the value of irrigation to different kinds of users. Zwarteveen (1994, 1997) makes a similar point with respect to the gendered nature of intra-household mediation of access to labour and irrigation plots.

In this chapter I have shown how the two contrasting idioms of accumulation affect access to irrigation plots and other livelihood opportunities (gardens, employment) for young couples and women of various statuses. Whereas the offspring of modernist plot holders in blocks A, B and D have mostly left the scheme to pursue professional careers in urban centres, creating room for the remaining offspring and spouse, including women, to get access to irrigated plots, increased pressure on irrigated land in block C has left young couples and widows with fewer options to get access to land within the officially irrigated perimeter. Yet, many widows and young couples have succeeded in gaining a livelihood by practising irrigation in gardens along the river or undertaking rain-fed agriculture on one of the dry land plots outside the scheme.

Interplay between livelihood pursuits and the physical and socio-economic environment

Equally important in the development of a portfolio of livelihood pursuits are the physical characteristics of the area surrounding the official water-network and the extent to which the resources offered by that environment can be claimed. Here stark differences can be observed between block C plot holders, who engage in wetland agriculture along the Nyanyadzi river and rain-fed agriculture in Chitinha and Nemaramba, whilst the Odzi river and surrounding area of blocks A, B and D offered considerably less opportunity to engage in such agricultural exploits. However, in block C the access to such alternative sources of livelihood and risk spreading is often mediated by clan leaders that claim authority over land allocation.

Woodhouse (2002, 2003) observes contrasting dynamics in wealth accumulation and mediation of access to natural resources in booming and stagnating areas in Southern Africa. Booming areas are characterised by increased agricultural output for expanding (urban) markets. Typical for these areas is an intense competition for land, often fuelled by immigration, and investments in water technology to increase productivity. Poverty in those areas is not primarily the result of low farm productivity, but a sign that some sections of the population fail to secure access to land and/or water. Whilst technology contributes to significant productivity rises, it is often not scale-neutral. Rather a variety in access to technology feeds a process of socio-economic differentiation that is structured through a process of resource capture by lineage elders. Landless labourers in such areas earn a living through wage employment on farms and obtain land through rental and sharecropping arrangements. In contrast, stagnating areas suffer from static or declining population densities due to emigration, low rates of farm investment (due to distance from market), and scarcity of farm labour. Technology can still trigger productivity increases in such areas, but only if introduced as a labour-saving option.¹⁹ Yet, the lack of market access often inhibits farm productivity increases.

¹⁹ The need for labour-saving technologies has become even more urgent in the face of the AIDS pandemic presently affecting large sections of the productive population of Zimbabwe.

The dynamics of wealth accumulation and pressures on both irrigated and rain-fed land in Nyanyadzi broadly reflect the trends that are observed by Woodhouse for a booming area. The access to irrigated land and the urban market through the main Mutare-Masvingo road has sustained the status of the Nyanyadzi as a booming area. In contrast, the communal areas South and North of the scheme could be characterised as stagnating areas, where people in the main rely on remittances from labour migration, craft making and livestock rearing. Yet the intricacies of these dynamics in Nyanyadzi demonstrate the existence of two different patterns that need to be historically situated. Whereas in block C pressures on the land have increased to the extent that plots are increasingly leased out, not to outsiders, but to young clan members without access to a plot of their own, in block A levels of out-migration have been such that plots are still predominantly rented by non-irrigators, besides the occasional entrepreneurial irrigator that seeks to expand his irrigation base. In block C lineage elders have mobilised various cultural counter-discourses to capture access and a mediating role in distributing access to resources located in the direct vicinity of (dry land, gardens) or even inside (*gurekures*) the irrigated network. In the other Nyanyadzi blocks such processes of resource capture by lineage elders has not occurred. With the decline of the Zimbabwean economy after 1998 the on-going trend of out migration of the offspring of modernist plot holders located in blocks A, B and D may have come to end or even be reversed. Thus the out-migration and urban settlement of a highly educated generation of sons and daughters may have been a temporary phenomenon closely associated with the fruits of independence (*cf* Berry 1993).

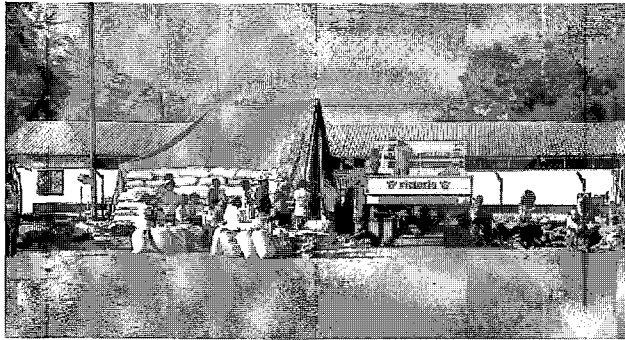


Photo 14: Collection of beans by private trading company at Nyanyadzi, June 1997
(Source: Alex Bolding photo)

THREE DIFFERENT SCHEMES: ALTERNATIVE MODES OF ORGANISING THE WATER-NETWORK

After showing what kind of different networks have emerged around the use of water and plots in Nyanyadzi scheme for the accumulation of wealth across generations, this chapter is devoted to emergent modes of (re-)organisation that various users have developed to respond to and cope with the vagaries imposed by the crumbling official water-network. By means of three case studies it is shown how Nyanyadzi plot holders have re-appropriated and re-worked the scheme. The modalities of this re-alignment are informed by the two patterns of accumulation described in the previous chapter and a third, political, idiom of accumulation that emerged in the late 1990s. The first case study is situated in block C where a traditionalist mode of organisation enables the successful implementation of main canal maintenance and crop marketing activities (8.1). The second case study highlights the attempts of modernist plot holders and their urban kin to improve the water supply situation of the scheme as a whole through the mobilisation of donor resources (8.2). Finally, a land conflict in block B highlights the failure of the traditional leadership, Agritex, Rural District Council, and civil court to fend off a land claimant mobilising a politically inspired network of ZANU(PF) politicians (8.3). In the conclusion (8.4) the strengths and weaknesses of the three modes of organisation are compared and placed within the context of emergent forms of organisation in Zimbabwe and sub-Saharan Africa. Finally some lessons from the Nyanyadzi case study are presented that inform future modalities of irrigation management transfer.

8.1 THE ORGANISATION OF MAIN CANAL MAINTENANCE AND TOMATO CONTRACTS IN BLOCK C

The first case study focuses on the organisation of maintenance activities in the main canal by the block C kraalhead. By mobilising the labour of a limited number of kin-based networks occupying the plots of block C, the kraalhead has managed to clear the annual loads of silt deposited in the main canal. In the face of on-going retrenchments the local Agritex office was no longer capable of tackling the silt problem, which in their view was to a large extent a result of the kraalhead's propensity to issue land along the main canal to close relatives and friends. Whilst the plot holders in Nyanyadzi's other blocks shied away from their official cleaning duties on the main canal, focusing instead on the Odzi river pump station for their water supply, the kraalhead managed to not only clean the canal, but also claim priority over the water it conveys. This claim was supported by various counter-discourses that were informed by the different leadership roles played by the kraalhead: a traditional leadership idiom claiming the soil, a ZANU(PF) councillor claiming the fruits of the war, and IMC membership claiming ownership over the scheme. First of all the emergence of a contested traditional landscape is presented, throwing a new light on the illegal settlements along the main canal as well as the emergence of a unified clan based network in Chitinha. Thereafter it is shown how the kraalhead succeeded in mobilising the labour required to desilt the main canal, and how an uncle to the kraalhead has secured financial viability of their water-network by successfully organising the production and marketing of tomatoes.

The traditional landscape in Chitinha: contestations and compromises

Landscapes are not just shaped by geophysical processes as geologists would have it, they are also shaped by the energies and exploits of men, who in the process appropriate the landscape. Thus landscapes become part and parcel of human history, and vice versa. A landscape may be claimed by a particular group of people as theirs. Alvord did so by first directing the digging of a furrow and next claiming a say over the land that was thus watered. Several traditional leaders claim the land presently irrigated by the Nyanyadzi main canal. Temporal alliances have been forged which have resulted in the dominance of the Nyanhanda clan over the block C command area, whilst the Jena clan has successfully claimed the area formerly irrigated by the MuNyanyadzi furrow. This alliance has little to do with the existence of a harmonious 'natural' community. Rather it is the result of a historically grown compromise. What is uncontested is the Nyanyadzi river itself, since contrary to land, in *Shona* culture water cannot be claimed by anyone, but God (*mwari*). The Nyanyadzi¹ river forms a natural boundary between the land of Chief Mutambara and that of Chief Muusha. The first Chief Mutambara and his people came from Mbire and were ferried over the Odzi river by crocodile, providing them with their name: the *VaGarwe* (crocodile) tribe. Chief Muushu also originated from Mbire and his people were called the *Nyamazha*,² after the sudden appearance of a woman, later wife, at the Chief's first homestead. What is contested is which headman has a say over the area between the Nyanyadzi intake and the Chikwize river, the area that is commanded by the Nyanyadzi water-network. The struggle between headman Matyashe and headman Gudyanga dates back to the days of the *Shoshangaan* (Gaza State) and became more intense with the establishment of the irrigation scheme and the onset of the liberation war.

Female kraalhead Mupingirwa's area

Headman Matyashe claims heritage over the area that comprises the Nyanyadzi water-network. In 1996 Aron Matyashe was the councillor of the ward upstream of Nyanyadzi (Shinja) and recognised headman under Chief Muusha, though the DA's office did not recognise his headmanship. According to Aron Matyashe, the first Chief Muusha (by the name of Neushoma), appointed three of his brothers as headmen to administer the corners of his area: Gudyanga to the South-west; Nechiora (Dima) to the South-East, and Matyashe to the North-East.¹ Matyashe settled in the centre of his area, leaving the administration of the corners of his expanse to Zimunda in the East and Dirikwe in the West. The Matyashes fared badly, their offspring was limited in extent and mostly female. By the time the Chieftainship was subjugated by the *Shoshangaan*, only one male member of the Matyashe clan was left to administer the headmanship. This Matyashe, named Mupoti, was subsequently abducted by the *Shoshangaan* to be trained as soldier for the Gaza state. In his absence Chief Muusha appointed Mupoti's sister, Mupingirwa, as caretaker of the Matyashes.

Headman Gudyanga made use of the disarray of the Matyashes to wage war on them, in a bid to expand the area under his control beyond the Chikwize river, northwards to the Nyanyadzi river. However, a hastily assembled army led by Mupingirwa inflicted a crushing defeat on

¹ The meaning of the name Nyanyadzi is contested though. Some claim it means 'shameful one'. Others say it refers to a person who struggles against drowning but fails in the end (*nya* indicating surges for breath, *dzi* referring to the final sinking). In another story, a baboon was chasing a hare. The hare stumbled on a river. After some hesitation the hare jumped in the water straggling across in desperation. The baboon could not swim, so he picked up some stones, and tried to hit the hare. The first stone missed, the hare shouted *Nya!* The second stone also missed, *Nya!* The third stone smashed the hare's head and he died, *Dzi!*

² Literally *nyama yazha yega*, something which comes just unexpected. Interview with councillor and unrecognised headman Aron Matyashe, 19 May 1997.

Gudyanga's fighters. Shortly afterwards Mupoti defected from the Shoshangaan army, returned and resumed his post as headman Matyashe. In his old age he married two wives. Both gave birth to a son. However, when Mupoti died the sons were still infants, and Mupingirwa was again appointed as caretaker. In 1897 Chief Muusha appointed the second son, Tofamangwana, after the first son, Nyika, had died soon after assuming office. Tofamangwana would rule the headmanship until his death in 1926. In recognition of her vital role in maintaining the headmanship, Aunt Mupingirwa was given her own area to rule, *nyika yevatete* (auntie's land) situated at the western end of the Matyashe area (presently located south of the Nyanyadzi main canal, see map 7.1).

Later the area was given to Maungira, sister to the present kraalhead Robi Bayoyuti. Robi was born in 1918 in Matyashe, and later married a man who got hold of plot C38. During the year of the *nzara* (1947) Robi and her husband moved to stay at the *muuyu* (baobab) tree along the main canal, where *tete* Mupingirwa had stayed. Robi and her husband were forced to leave the place, since the land allocated to Robi was designated as grazing area. But in 1979 Robi's father (Tofamangwana) instructed her via a spirit medium to return to auntie's place. That was during the war, when the scheme had been closed and the *vakomana* were roaming the area. After her husband died, Robi inherited the irrigated acres. Robi is not only the female kraalhead of the area South of the main canal, allocating land to whomever wants to stay in the area, she also inherited the skills of her father, who was a *nganga*. Robi cures sick people by prescribing certain *muti* (medicine, in this case herbs). When she touches the skin of a snake she can become possessed with the spirit of her father, who advises her what to do. During an annual ceremony at the baobab tree (*zvidiwa*) officiated by Robi the ancestors of the Matyashes are offered millet beer in recognition of their role as caretakers of the land and its people.ⁱⁱ

Contrary to what Agritex officials think it is not kraalhead Nyanhanda, but Robi who is responsible for settling people along the main canal. Robi's presence is acknowledged by kraalhead Nyanhanda, but he denies the claim of headman Matyashe over Chitinha. The area administered by Robi represents in fact the last foothold that Matyashe has over his former area of influence.

Nyanhanda's contested claim over Chitinha

To understand this wrangle we have to go back in time, to Tofamangwana's sons. All the sons of Tofamangwana enjoyed some form of Methodist education and left the area to engage on successful labour careers in town. Neither of them wanted to go back to succeed their father as the new headman. Thus there was no effective headman Matyashe during a critical period in the development of the Nyanyadzi water-network. In 1952 Joshua Matyashe was persuaded to come back. In 1968 he was installed as the next headman by the Chief.

When Alvord came to ask permission from local traditional leaders to construct the MuNyanyadzi furrow, headman Nenohwe, kraalheads Nemaramba and Pirani Nyanhanda, and *mupurisa* Jena became actively involved in the irrigation venture. The Matyashes were represented by the brother of Maungira, who played a role in asking the spirits for permission to open the big Nyanyadzi canal.ⁱⁱⁱ However, whereas Nenohwe, Nyanhanda and Jena (Chimoyo) got hold of two-acre plots in the MuNyanyadzi scheme, the Matyashes showed no interest in irrigation, since they stayed in a well watered area and had no acting headman at their disposal to claim a two-acre plot.^{iv} With the benefit of hindsight one can observe that by opting out, the Matyashes started the process of forfeiting their influence over the irrigated command area.

Another remarkable aspect is that Pirani Nyanhanda got a plot allocated in an area which fell under Chief Mutambara, rather than Chief Muushu, the chief under whom Nyanhanda resorted. According to Ephraim Nyanhanda, the present kraalhead for Chitinha, his grandfather Pirani had walked to the area now known as Chitinha from his home in Gudyanga. Subsequently his uncle, headman Gudyanga, allocated Pirani the land south of the Nyanyadzi river and east of the two kopjes. The claim of the Nyanhandas over the area is further related in a tale involving Pirani and Alvord. When the MuNyanyadzi scheme was washed away in 1942, Alvord requested Pirani to settle in block A, since Pirani had built a reputation for himself as a negligent irrigator, who could learn a thing or two from the block A irrigators. Pirani refused, telling Alvord:

'This is my area (Chitinha, AB), or else I wouldn't even have allowed you to construct this furrow (the present Nyanyadzi main canal, AB).'^v

Thus it was that block C was opened up in the sandy soils of Chitinha rather than in the rich soils of Save alluvial plain. Aron Matyashe, the unrecognised headman, had a different story to tell about Nyanhanda's ascent as traditional leader in Chitinha.^{vi} According to him Pirani Nyanhanda killed one of his own brothers who was the incumbent headman Gudyanga. Pirani had to flee from the wrath of his other brothers and sought refuge in headman Matyashe's area. Next, Chibvuma, the kraalhead administering Chitinha area on behalf of Matyashe handed over the arduous task of collecting head tax and delivering the money to the Native Commissioner's office in distant Melsetter, to his *mukwasha* (older brother) Pirani Nyanhanda. Later Pirani made peace with his brothers in Gudyanga. Thus it was that Pirani 'stole' the land from Matyashe and brought it within the sphere of influence of headman Gudyanga. Matyashe took up the issue in the Chief's court and was granted authority over Nyanhanda and Chitinha area. Yet the office of the District Administrator has so far refused to acknowledge the Matyashe headmanship.

For the exertion of local leadership kraalhead Ephraim Nyanhanda does not need any recognition from headman Matyashe or the District Administrator. Capitalising on the promises of the freedom fighters and his status as former councillor for ZANU(PF) the kraalhead has persisted in his refusal to submit taxes to the DA's office, whilst his authority with the local people is derived from his status as member of the Nyanhanda clan that has successfully claimed heritage over the Chitinha area furthering the interests of the 18 inter-married irrigation clans that were originally involved in the MuNyanyadzi scheme.

Isaac Jena, Mupurisa at Tsianwa

The Jena clan forms another pillar of the clan based irrigation network in Chitinha. When the first Chief Mutambara (named Bapiro) arrived by crocodile ferry in the area North of Nyanyadzi river, the area known as Tsianwa³ was allocated to Jena Nerunyanga.^{vii} The Jena clan eldest is not a kraalhead (*sabhuku*), but acts like a *mupurisa* (litt. policeman) on behalf of both headman Nenohwe and kraalhead Nyanhanda. The latter is remarkable, and has to do with the bond that has been crafted between the three clans on account of their involvement in the MuNyanyadzi water-network. When that scheme washed away, all moved across the river to continue irrigation in block C. Again later, when the new irrigation scheme in Nenohwe was opened (in 1995) many sons of the original irrigation clans got acres there.

In total 23 *misha* (homesteads) are located in Tsianwa, that comprises the former irrigated command area of the MuNyanyadzi scheme. According to Isaac Jena, the present *mupurisa*,

³ Tsianwa is the name of the *kopje* that lies west of the area formerly irrigated by the MuNyanyadzi furrow.

no one in Tsianwa pays taxes. If someone is interested in settling in Tsianwa, that person first has to pay some money to headman Nenohwe, after which Isaac will allocate a stand. Other duties of the *mupurisa* are to prevent unnecessary cutting of trees, reporting of thieves to headman Nenohwe's court, and allocation of land to establish an irrigated garden along the Nyanyadzi river.

The lost headmanship of Matyashe

What happened to Joshua Matyashe after the Chief had officially crowned him as the new headman in 1968? During an official ceremony inaugurating the new Tribal Land Authorities in 1969, Joshua refused to receive the official regalia of a recognised headman from the District Commissioner. Joshua feared being labelled a sell-out to the nationalist cause. All the urban based sons of the Matyashe clan had joined the nationalist cause and despised the Rhodesian Front style revival of traditional leaders. After the war, Joshua claimed to have no interest in claiming headmanship from the DA's office. In his view politicians came and went, whilst the land did not move.⁴

Box 8.1: Drawing boundaries, searching for traditional communities

After independence the traditional leadership fell out of favour. Their presence in irrigation and resettlement schemes was denied. The onus of rural development was laid in the hands of line ministries and ineffective committees at village and ward levels. The latter did not control land nor did they control the use of other natural resources. Development initiatives were the prerogative of the line ministries. The invasion of squatters in both irrigation and resettlement schemes was officially blamed on the illegal land allocation practices of traditional leaders. Collection of head taxes by kraalheads proved ineffective as many did not even bother to pay the taxes to the DA. To redress the situation the Land Tenure Commission (1994, 132) advocated a radical reform inaugurating a revival of the traditional leaders in local governance. VIDCOs were to be abolished and replaced by traditional village leadership and WADCOs were to co-opt traditional leaders and senior civil servants, except for resettlement areas. Whilst the latter exclusion precluded resolution of the squatter problem, the reform did lead to a new attempt to adjudicate, survey and register traditional village boundaries and authorities in communal areas (GoZ 1994, 129).

The task of crafting a map with villages and traditional leaders was left to the Agritex office, which started working on the assignment in November 1995. A year later the map had still not been completed. The boundaries turned out to be heavily contested amongst various self-proclaimed and officially recognised traditional leaders. The first inventory of traditional leaders was supplied by the councillors. Next all individual Chiefs were approached resulting in yet another list and map. Then the DA's office supplied a list, which did not match the previously collected information. Finally the national voters roll was invoked, which yielded even more confusion. An old undated map from the DA's records was dish up and subsequently used as the base map. In appreciation of the difficulties the Agritex Provincial office had decided to embark on an exercise on the ground, checking with local kraalheads and headmen which area fell within their jurisdiction and how many people inhabited the various villages. This proved an even more difficult task. Both headmen and kraalheads habitually overstated their areas of influence, whilst Agritex did neither have the transport nor the personnel to do the job properly. The Agritex office came to resent the work, which in their eyes yielded no solution to the problem of squatters in the resettlement schemes and only served to strengthen the authority of the DA's office. The only tangible result of the whole exercise was a surge in litigation cases at both the traditional and district courts involving traditional leaders that wished to be recognised in order to reap the anticipated benefits of their co-optation in local governance.

⁴ Aron Matyashe interpreted this saying of his uncle as indicative of the latter's independence from the government. Since the people recognised the headmanship of Joshua, there was no need to get this authority reconfirmed by the government of the day.

Shortly after the death of his uncle Joshua, Aron Matyashe came home. He had completed a successful career as chartered accountant with various companies in Harare and Mutare.⁵ Aron quickly took up the plight of the headmanship with Chief Muusha, paid a cow to the Chief, and was officially installed as the new headman in 1989. During the subsequent 1990 council elections Aron Matyashe was elected councillor for Shinja ward. In 1992 Matyashe paid the Chief another beast in order to get official recognition as headman with the DA's office. The DA, however, was reluctant and requested more evidence, pending new legislation on chiefs and headmen. Matyashe collected three testimonies to the effect that Joshua Matyashe had been headman, despite his refusal to be recognised as such by the Smith regime.^{viii} The DA, however, stalled matters until the whole issue of headmen and chiefs was revived by the new government policy on village assemblies, which co-opted traditional leaders in the existing committees for local governance (see box 8.1).

By this time, Chief Benjamin Muusha was suffering from a mental illness. A meeting organised at the Chief's court proved inconclusive since John Muusha, the caretaker son of the Chief, did not consider himself senior enough to rule over the issue. During two subsequent meetings, convened at the request of the Agritex team responsible for delineating traditional leaders and their areas of control, headman Gudyanga did not pitch up. Finally at a meeting held at the Chikwize river in October 1996, the Chief did not pitch up. During the meeting both headman Nechiora and Gudyanga denounced Matyashe on account of him not wearing the half moon insignia, which was issued by the colonial regime to recognised headmen. Yet, Chief Mutambara confirmed Matyashe's claim to the headmanship to the Agritex team. An old, undated map delved up from classified files at the DA's office did the same. Whilst Agritex thus included Matyashe on their map as the headman for Nyanyadzi the reality on the ground was very different. All of Nyanyadzi's kraalheads, except Robi, pledged allegiance to headman Gudyanga.⁶

Conclusion: contested but firm terrain

If anything this section has demonstrated the fluidity and contested nature of land claims by traditional leaders. Despite the contested nature of Chitinha's traditional landscape a working order has been crafted. The traditional alliance forged by Nyanhanda, Jena and Mupingirwa has been quite strong and uniquely tied to the first irrigation furrow initiated by Alvord.

Cleaning the main canal, claiming the water

The March 1994 crisis concerning the deployment of the Agritex maintenance force (known as general hands) and subsequent loss of the 1993-94 maize crop had produced one change: Agritex could henceforth request the IMC to mobilise labour from the plot holders in the event of emergency repairs (chapter 6). The maintenance gang numbered 40 general hands during the 1980s, but due to budget cuts their number had dwindled to four by 1995. It was obvious that the gang would be too small to cope with even a minimum of repairs on the Nyanyadzi canal and road network. The force was equally unfit to deal with emergency

⁵ Aron was the son of a United Methodist father, who spent his entire working life in South Africa as a carpenter. Aron's brother also embarked on successful careers as labour migrants in Harare and Bulawayo. Aron's youngest brother joined ZANLA and was killed in action at nearby Chayamiti.

⁶ Some kraalheads tried to benefit from the tug-of-war between Matyashe and Gudyanga and the Chief's mental illness by propelling themselves as headman in their own right. Kraalhead Dirikwe (residing in block A) tried his hand in 1996, failed to get official recognition, and was subsequently stripped of his right to hold court sessions by headman Gudyanga. Kraalhead Zimunda, ruling the area East of Matyashe also proclaimed himself headman, but lost his case in the Chief's court.

repairs necessitated by gullies draining in the canals, storm drains eating away parts of the command area, or silt choking the pump sump.

The shortage of funds was so acute that Agritex could no longer undertake routine maintenance activities it had undertaken in the past, such as the annual desilting of the intake weir and bi-annual desilting of the night storage dam. This vicious circle of shortage of labour, financial means and basic equipment (i.e. a tractor and truck) negatively affected the attempt to arrest gully formation along the main canal by means of mechanical conservation efforts and the attempt to limit the damage caused by gullies traversing the irrigated command area. One such gully in block C had been targeted for reclamation through a combination of mechanical conservation works (gabions, cross-dams) and the planting of vertiver grass. Due to late delivery and breakdown of the truck that was earmarked to ferry the gabions, only the vertiver grass was planted during the dry season of 1995. However, the absence of a source of water to promote healthy germination of the grass, resulted in the gully taking out another half acre of irrigated land during the first heavy downpour of the 1995-96 rainy season. Whilst kraalhead Nyanhanda and other block C plot holders interpreted such half-baked attempts as a sign of the growing incompetence of Agritex, strengthening their resolve to refuse the payment of maintenance fees, the local Agritex office blamed the uphill struggle they were facing squarely on the shoulders of kraalhead Nyanhanda, who was deemed responsible for the illegal settlements along the main canal causing the increased gully activity.

Kraalhead Nyanhanda countered such accusations by claiming that the whole struggle of liberation had been fought on back of the promise that once Independence had been attained plot holders could settle and farm as they wished, without paying the government for any services provided. Now that Agritex failed to provide essential services like maintenance and protection of the irrigated command area, it had no ground whatsoever to extract payment of fees, certainly not if these would simply disappear into government coffers. Kraalhead Nyanhanda adopted a more active role during the subsequent season towards maintaining the essential parts of the water-network. Cautiously claiming the area and the water-network as part of his heritage, whilst flagging his role as an IMC member, he mobilised the block C plot holders to desilt the main canal and repair the flush gate at the intake weir.

The number of labour days thus mobilised was quite substantial (graph 8.1). During three separate periods of 14, 13 and 7 days respectively in September, October and November 1995 a total of 2,794 labour days were spent in desilting the main canal. During the subsequent winter season of 1996 another 4 days were spent on the main canal claiming another 300 labour days. These figures contrast sharply with the eight labour days provided by block A and B plot holders to desilt the main canal, during the whole of the 1995-6 season. The IMC was also ineffective in mobilising sufficient labour from block A, B and D plot holders to desilt the Odzi pump house.

To rally the labour force from block C, Nyanhanda only drew labour from those cultivating plots in excess of half an acre (0.2 ha), whilst widows were allowed to send a (grand)child to fulfil their labour obligations.⁷ The maximum number of people working on the canal during any one day was 112, including non-irrigators that nevertheless made use of the canal water (e.g. for brick making). During *chisi*⁷ days the work was halted.

⁷ During *chisi* days respect is paid to the ancestral spirits. *Chisi* days are only observed by members of royal lineages and other African traditionalist members of the community.

During the wet 1996-97 rainy season many landslides occurred blocking the main canal. To desilt the canal a substantial labour force had to be mobilised every other week throughout the whole season. At the end of that summer season and during the subsequent winter season a new pattern of water use developed. As soon as the canal was ready to be opened again, block C plot holders would claim water first, damming the main canal at the end of their block. This practice of taking water first was denounced by other Nyanyadzi plot holders during public meetings, but vigorously defended by IMC member Nyanhanda on account of the block C plot holders' commitment towards desilting the main canal. Thus an effective split of the Nyanyadzi water-network was forged by the irrigating clans of block C. During the subsequent wet rainy season (1997-98) more plot holders from blocks A, B and D responded to calls from the IMC to desilt the main canal, if only to sustain their claim to Nyanyadzi river water.

The nascent secession of block C from the rest of the scheme is also reflected in the organisation of marketing of cash crop proceeds. Green beans and tomatoes are the main cash crops grown in Nyanyadzi. After the demise of the farmers' cooperative in the late 1980s, the organisation of bulk marketing became a task of the scheme's management, i.e. Agritex and the IMC. With the on-going economic liberalisation policies in the 1990s, new opportunities presented themselves in the shape of a variety of contract farming options for tomatoes, beans and paprika offered by different national and regional companies. Yet, the securing of crop contracts involves a balancing act that hinges on trust and effective control over the marketing process. And this is where the autochthonous clan-based network in block C has been more successful than the modernist plot holders of blocks A, B and D.

As shown in chapter 6, the IMC has been haphazard in dealing with the issue of crop contracts. Whilst it has been quite successful in planning crop contracts, collecting

information on acreages and interested growers through block IMCs, the IMC leadership has been ineffective in controlling the actual delivery of the crop to the contractor. The 1994/95 bean contract with AgriSeeds fell through, because a majority of plot holders sold their beans to competitors that collected the crop at field edge rather than at the central AgriSeeds depot at Nyanyadzi business centre. On top of this advantage, the competing companies could afford to pay a higher price, since they had not incurred the costs of supplying the growers with free seed and fertiliser. Side marketing is particularly beneficial to both free-riding companies and plot holders at times of scarcity, like in the 1995 winter season. During ordinary rainfall years a crop contract offers market security to the plot holders, and then it is mostly the contracting company that defaults on its contract obligations once the market is saturated.

The persistent practice of 'side-marketing' by plot holders combined with aggressive buying strategies of competing companies has yielded the scheme a bad reputation amongst crop contractors. During the 1996 and 1997 winter seasons no crop contracts were offered to bean growers in blocks A, B and D. This implied that the plot holders had to procure their own seeds and fertiliser and were at the mercy of passing buyers at harvest time (see Photo 14).^{xi} In practice this has resulted in some of the wealthier plot holders putting in an early crop, using good quality seeds, capitalising on the high prices and abundance of interested buyers in the early season. A majority of plot holders uses bad quality seed (often from previous year's harvest), lacks the labour to put in an early crop, and depends on the level of saturation of the market whether the crop can be sold in bulk. The later in the season, the better the bargaining position of a passing buyer becomes. Thus the absence of bean contracts has put the main income source of the average plot holder at risk.

Crafting trust and effectiveness

In block C, an uncle to the present kraalhead, Maanda Nyanhanda has successfully managed to honour and secure further tomato contracts for the block's irrigators.^{xii} They started producing in 1983 for a company called Lemco that operates from Mutare (some 100 kilometres from Nyanyadzi). At first Lemco would only come to collect the tomatoes produced in Chitinha. In 1984, block C tomato producers clinched their first contract. In the contract the company committed itself to provide the seed, fertiliser and chemicals required, whilst it offered a guaranteed price plus timely collection of the produce. The producers committed themselves to grow a certain acreage of tomatoes, which would be delivered exclusively to the company at the agreed price. Maanda Nyanhanda signed the contract on behalf of the producers, whilst the company committed one of its representatives as contact person.

In 1997 the contract was signed with Cairns, another Mutare based company, and included 108 tomato producers from block C. Cairns offered a guaranteed price of Z\$700 (US\$59) per ton in exchange for free seed and collection of the produce. When the first five or six producers are ready to pick their tomatoes, Maanda phones the company to send a truck. In the second week of the harvesting season Maanda may call for two trucks, whilst at the peak of the season six trucks a week may just suffice. Maanda keeps records on the number of boxes sent in by each producer, specified per truckload. During the harvest season the company writes a monthly cheque in the name of Maanda paying for the truckloads delivered. Maanda is phoned by the company representative to come and collect the cheque in Mutare. The producers pay Maanda one zim dollar commission for each trip to Mutare, to cover his transport and food expenses. Maanda banks the cheque, changes the amount in small cash and pays out each producer according to the number of boxes delivered. If there is

any mistake, Maanda goes to Cairns in Mutare to compare his records with those of the company.

The system has been in operation since 1984, and only during the dry winter season of 1995 no tomato crop was grown. During the 1996 winter season some 750 tons of tomatoes were delivered at an average price of Z\$600 per ton, making for a turn-over just short of half a million zim dollars (approximately US\$37,000). The success of the operation is to a large extent determined by the trust vested in the uncle of the kraalhead and the authority that is wielded on account of the kraalhead. The tomato contract demonstrates the strength of the lineage-based network in block C.

Conclusion: the long postponed birth of a community managed irrigation scheme

In the mid 1990s, through the investment of labour in the maintenance of the main canal, the 35 clans residing in block C under the vigorous leadership of kraalhead Nyanhanda have succeeded in claiming the Chitinha water-network and its surrounding area as a community irrigation scheme. The plot holders and other inhabitants of the area do not pay taxes to the DA's office nor do they pay maintenance fees to the local Agritex office. By filling the gap left by the government, block C plot holders have not only claimed ownership over the main canal, but also priority in use over the water it carries. Thus an effective split has been forged with the remainder of the Nyanyadzi water-network. The water bailiff for block C is a member of the Jena clan and his daily work of distributing the water amongst the many unofficial plot users runs smoothly. The government pays for the bailiff's services, but block C plot owners acknowledge his authority on account of his clan membership rather than his official status as representative of the managing agency. The bailiff is also their main source for advice on agricultural matters.

8.2 NACOD'S SONS AND DAUGHTERS: IMPROVING THE SCHEME WITH HELP OF DONORS

The second case study looks at the attempts of an urban based network of mostly modernist sons and daughters of Nyanyadzi plot holders from blocks A, B and D, to improve the water supply situation. Formally organised in the Nyanyadzi Advisory Committee On Development (NACOD), the network managed to lure donor organisations into the scheme, looking into possibilities for constructing a dam on Nyanyadzi river as well as a variety of other projects that could improve the livelihood of the scheme's inhabitants. However, their operations and intentions were contested by various groups in the scheme that accused NACOD of representing the interests of the (Ndonga) opposition party and big business. Yet, in 1998 the organisation managed to secure funds from the European Union for the lining of the main canal, reducing percolation losses and improving the water supply from Nyanyadzi river.

Early history: key actors, plans and suspicions (1988-1995)

I first met John Gwitira, the charismatic chairman of NACOD, in December 1995 in his spacious, air-conditioned office in Harare. He had just returned from an all-Africa conference held in Maastricht, Holland,⁸ which he had attended in his capacity as director of the regional office of Consumer International. John Gwitira had been born the son of a Nyanyadzi plot holder *cum* businessman. His father played an influential role during the nationalist surge in Nyanyadzi. He had twice been detained on account of his acts of resistance (in 1964 and again in 1975). John had enjoyed a Methodist education and left the country in the early

⁸ The Africa conference was a personal initiative of the Dutch Minister for Development Co-operation, and was attended by many African heads of states, and representatives from NGOs and the international donor sector. Robert Mugabe used the platform to inform the international community of his anti-gay stance.

1970s to become one of the first ZANLA commanders entering Northeast Zimbabwe with a group of trained guerrillas in 1972.⁹ In 1975 he was appointed general commander of the newly formed Zimbabwe Liberation Army by Ndabaningi Sithole, to whom he is said to be related. By means of this new army Sithole hoped to gain control over the divided nationalists, by-passing the ZANLA senior command and the ZANU leadership that was kept in Salisbury jails. However, the senior ZANLA commanders disliked John Gwitira's sudden promotion and the leadership in captivity decided to depose Sithole as the president of ZANU, elevating Mugabe to the post (Martin and Johnson 1981, 81, 218). Thus John Gwitira fell out of grace with the later ZANU(PF) leadership and became firmly identified with the Ndonga opposition. One of the practical implications of these events was that John did not become a leading figure in the post-independence administration like other early ZANLA recruits, but embarked on a career in the emergent donor sector. After serving for five years as deputy director of ENDA Zimbabwe, an international NGO concerned with smallholder agriculture, he became the director of Consumer International, an international donor funded NGO that engages in all kinds of citizen advocacy activities.

Initial activities and local resistance

John Gwitira and Dr Nhachi, professor at the Parienyatwa Medical school and descendant of a block A plot holder, were instrumental in the formation of a network of Nyanyadzi sons and daughters that worked in the capital, in 1988. John related the early history of their association:

'We came together and tried to organise ourselves in order to be able to develop the place where we all came from. The application to register as an official NGO got stuck because of government politics. (...) You know, the scheme used to be fenced so as to keep cattle and goats out. After the war problems in Nyanyadzi started. The fence had been stolen and the political land map showed divisions between ZANU(PF), ZANU(Ndonga) and even ZUM supporters. That is why the government did not want to have much to do with the scheme after the war. The area was rubber stamped as ZANU(Ndonga), despite the presence of local ZANU(PF) supporters. Now NACOD was not very active in the beginning. We had difficulties with raising funds. But we managed to raise funds for the fencing of the scheme. However, since 1990 we have been meeting consistently. We meet here in my office after work time, normally from 6 pm to 8 pm. We meet as frequent as once in two weeks, depending on whether I am available. We have been writing a lot of proposals.'^{xiii}

The stated mission of NACOD as contained in its draft constitution, is

'to provide a platform where Nyanyadzi "citizens", spouses and offspring based outside Nyanyadzi shall provide advisory services, assistance and support for the socio-economic and cultural development of the Nyanyadzi community.'^{xiv}

⁹ John Gwitira took on the *Chimurenga* name of Kenneth Gwindingwi. He was one of the first 45 guerrillas that had been trained in guerrilla warfare by Chinese instructors in Tanzania (Mgagao). During their subsequent training with FRELIMO forces in Tete province, Mozambique, they made contact with a local spirit medium that directed them to the place where the rebellious Chief Mapondera had been caught by the settler Government in 1904. This place became the site of the first ZANLA bases in Mozambique. Later on Gwitira attended the 'congress of ancestral spirits' in which spirit mediums on behalf of Karuwa (Kaguva) blessed the resumption of the war of liberation (McLaughlin 1996, 240-1). Kaguva, together with *Ambuya* Nehanda, had been leading figures in the Shona rebellions of 1896-76 against settler occupation. Nehanda's last words, before her death by hanging in 1898, were that her children one day would liberate the country. The guerrillas consulted her spirit, presenting themselves as her children who were going to liberate the country. Later her spirit-medium was abducted from the country to guide and bless the guerrillas in their fight. Spirit mediums were instrumental in mobilising support for the guerrillas and instilling a sense of moral dignity to their plight (see Lan 1985, Martin and Johnson 1981, McLaughlin 1996).

During the unprecedented drought of 1992, the scheme fell dry, and NACOD requested the help of Agritex irrigation specialists to resuscitate both Chakohwa and Nyanyadzi scheme by drilling boreholes to supplement water. The request only concerned expert advice on the costs of drilling and provision of pumps. The required funds and transport would be provided by NACOD itself.^{xv} However, the effort came to naught. But by 1994 NACOD had mobilised three potential donor organisations that were prepared to work on different elements of a master plan for reviving Nyanyadzi scheme, showing the extent of the network of NACOD and abilities of its members in writing development proposals.

At a general meeting, held in Nyanyadzi in August 1994, the governor of Manicaland province officially launched a local counterpart organisation, called the Nyanyadzi Development Board (NACOD-NDB). The NDB acted like a representative organisation that included all interest groups in Nyanyadzi, such as the ZANU(PF) women's league, church, IMC and others. Both the NACOD representatives and the Governor stressed the a-political nature of the organisation, requesting sceptics to override their political differences for the sake of development. At the meeting a scholarship fund was launched, that was named after J G Chatema, the Nyanyadzi headmaster who had been in the forefront of the successive African nationalist movements.

Yet NACOD's initiatives met with various forms of resistance in Nyanyadzi, mainly from local leaders that were with ZANU(PF) or of royal descent. Some suspected NACOD represented the interests of Harare businessmen that were keen on taking over the scheme, or alternatively selling it to ARDA, the para-statal organisation that ran Middle Save irrigation estate. Others, notably the war veterans that worked for the Ministry of National Affairs, and the Social Welfare Department in Chimanimani, thought NACOD was:

'a child of Ndonga. It was developed under the pretext of development. It would be seen in Nyanyadzi as Ndonga coming in with development (...) During the war certain businessmen took money from the coop claiming that they had bought clothes for the vakomana with that money. A lot of them grew rich over the war years. People make Nyanyadzi irrigation a business playing ground. You know some people did university and still keep the plots. There is a lot of leasing going on there. (...) Other businessmen just sit in their shops and have their vashandi (labourers, AB) working on the land.'^{xvi}

Again others pointed at the inclusion in NACOD of an ex councillor that had been suspended from the Rural District Council on account of fraudulent behaviour. They suspected NACOD was only interested in luring donors to the scheme in order to enrich themselves with donor funds.

John Gwitira was keenly aware of these allegations, but thought they would ebb away with time. In his view the opposition against NACOD was mainly instigated by three notorious troublemakers (including the block C kraalhead Nyanhanda) who had been sell-outs during the war, but later joined ZANU(PF). Incidentally these three were also known as troublemakers within Agritex circles, responsible for obstructing development of the scheme and instigating others to refuse to pay water fees. All three had been frequently elected to sit on the IMC and shared a past with ZANU(PF), either as councillor or party representative. Kundhlande, another NACOD member, who was the deputy director of SAFIRE, an NGO that worked with natural resource management projects, alleged that Nyanhanda had grown bitter over his failure to bring about any development in his area during his ten years at the district council. Kundhlande also refuted that NACOD was representing big business:

Mutezo¹⁰ was the only businessmen in their midst.^{xvii} Rather than taking money, the members had invested a lot of time and money in NACOD.

NACOD's members and plans for the scheme

So, who were the members of NACOD and what were their plans? The 1995 executive of NACOD consisted of a mixed group of Harare based professionals that operated mainly in academic circles, the development aid sector and the service sector.¹¹ Notable is that they had all enjoyed missionary education and were the offspring of modernist plot holders in blocks A, B and D, that were not autochthonous to Nyanyadzi and had flocked to the scheme in the early years of its existence. The NACOD members had all 'made it' to some extent, being well-off and not at all representative of the average Harare based worker. None of them had jobs in the government bureaucracy or ZANU(PF) party hierarchy. None of them originated from block C and only two were related to traditional leaders in Nyanyadzi. Most originated from staunch nationalists that played an influential role during the days of African nationalism, associated with Sithole's Ndonga party.

The vision of Nyanyadzi scheme of the NACOD executive firmly identified with Alvord's modernisation project. Their aim was to revive the scheme as a highly productive, commercial community undertaking put on a sound agro-industrial basis, providing a prime attraction for passing tourists. Their view of the scheme was informed by its glorious past and former agricultural success. Kundhlande lamented the fact that most Nyanyadzi plot holders only seemed to be producing at subsistence level, whilst the edges of the scheme had been invaded by outsiders, who he deemed responsible for the scheme's demise. The scheme had not grown whilst the number of people depending on it had. Whilst he acknowledged that in a way the irrigation scheme had provided a spring board to him and his fellow NACOD urbanites to embark on a successful professional career, he stressed he had not forgotten about the place:

'Look, I am a Harare citizen, but in actual fact I would like to have a plot in Nyanyadzi and go back. But that is not possible in the present set-up. My father had four acres and we were four sons, one daughter and our mother. We would have ended up with one acre each. But that is not viable. You cannot survive on one acre only. So what we need is expansion of the scheme, then people will go back. But then again water supplies must first be made reliable.'

John Gwitira also stressed his roots were in Nyanyadzi and indicated that he would like to retire there. In the course of 1994 NACOD had developed a plan for the revitalisation of the Nyanyadzi water-network. NACOD was seeking donors to fund separate stages of the plan. The plan foresaw firstly in securing a dam on the Nyanyadzi river, obviating the need for pumps on the Odzi river, except for supplementary water supply during drought years. The dam would allow for expansion of the scheme; resettlement of those people who were practising rain-fed cultivation along its edges; and produce so-called forward linkages that would bring economic activities to the scheme. Local agro-industries such as canning factories and a micro-hydel plant would be established. The dam would also allow for the production of high value horticultural products such as spices and paprika. The plan foresaw in the hand-over of the scheme to its users and sought to investigate possibilities for securing

¹⁰ This was a son of Obed Mutezo, the African nationalist that features prominently in the book of Ndabaningi Sithole (see 5.2).

¹¹ Amongst their midst were two professors and a lecturer at the University of Zimbabwe; many members operating in the service sector (National Foods, Post and Telecom Company, Venture Capital Company); two in the donor sector, and one businessman. The total membership of NACOD comprised some 60 urban-based members.

title deeds. Another part of the plan concerned the development of the local Nyanyadzi clinic by upgrading it with a maternity ward, x-ray room and other facilities.

Two feasibility studies

By 1995 NACOD had secured the interest of three donor organisations. Africa 2000, an environmental NGO, provided funds to tour a delegation of Nyanyadzi plot holders around farmer managed irrigation schemes in Honde valley. Later this NGO provided local training courses in environmental awareness. A small Irish donor organisation (APSO), with extensive experience in Zimbabwe's education sector, was prepared to fund the first stage of the plan. In July 1995 APSO contracted two consultants (one Irish, one Zimbabwean) to do a feasibility study on the possibilities to rehabilitate the scheme (a dam) and explore options for socio-economic development of the community (income generating community projects). The arrival of the two consultants in Nyanyadzi raised the expectations of local plot holders to fever pitch. They expected at least a dam from the exercise. Local Agritex staff was weary. It soon transpired the costs involved in the construction of a dam were far beyond the financial means of a small NGO like APSO.

Agritex staff feared they would be blamed for obstructing the construction of the dam, as had been done before.¹² The main technical argument against the dam was the prevalent level of siltation in the Nyanyadzi river, shortening the productive life of the dam. In general Agritex personnel regarded the activities of NACOD with mixed feelings. On the one hand they felt NACOD by-passed them, since the NACOD executive did not report back to Agritex, even when an Agritex officer had provided technical or financial details of an improvement plan. On the other hand, it was felt that NACOD could serve a good purpose by luring donor agencies to the scheme.

In the end the two consultants identified a number of options to rehabilitate the scheme in two separate feasibility reports (Delehanty 1995, Nyakutsikwa 1995). Both favoured the construction of a pumped borehole in the Odzi riverbed for each block over the construction of a large dam and lined main canal.¹³ The Nyanyadzi dam was considered expensive,¹⁴ whilst a combination of existing levels of environmental degradation and submergence of productive farmland in the river catchment affected its feasibility. The construction of submersible pumps in the Odzi riverbed provided a number of advantages. It would ease the impending turn-over of management and financial O&M responsibilities from the government to the farmers by splitting the scheme into separate blocks with their own source of water. In addition boreholes were deemed more reliable, since they benefited from the large storage provided by Osborne dam. And thirdly, sand screens fitted on the submersible pumps could tackle the problem of siltation. In addition to rehabilitation some income generating projects were suggested to cater for the non-irrigators in the community.¹⁵

¹² During the 1994 visit of the Governor, the IMC had toured him along the Nyanyadzi river to show the three potential dam sites identified in the early 1970s. They then accused the Agritex Chimanimani office of blocking its construction.

¹³ Delehanty (1995, 48) commented: 'There is a perception by many in the community that a major dam project is the only answer to the communities problems. Often a reluctance in discussing other options was experienced.'

¹⁴ The total costs of constructing the dam, lining the main canal and installation of silt traps was estimated at Z\$20.2 million, whilst the borehole option was estimated to cost Z\$4.8 million only (Nyakutsikwa 1995, 29). The annual running costs for the borehole were estimated to be in the order of Z\$0.6 million.

¹⁵ These options comprised improvements of the local craft market, suggested new courses at the local training center, training for the cooperative furniture project, enhanced facilities for the women's cooperative shop,

During a feedback meeting to the NACOD executive in Harare, the two consultants' reluctance to endorse the Nyanyadzi dam was commented on disapprovingly. The borehole option was whisked off the table.^{xviii} The two feasibility reports slowly trickled through to the Nyanyadzi community and by December 1995 the councillor was announcing at the Rural District Council that the community preferred the dam option, since the boreholes would present a financial burden that could not be born by the plot holders.^{xix} In the same month APSO announced it could fund none of the identified options,¹⁶ and forwarded the feasibility reports to the office of the European Union.^{xx}

Finally success: rehabilitation of the main canal (1996-98)

The sudden death of John Gwitira in 1996 provided a severe blow to the organisation. However, during his well attended funeral in Nyanyadzi, NACOD under the new leadership of Dr Nhachi and Kundhlande decided to push ahead. They broadened the membership of the Nyanyadzi Development Board by including ZANU(PF),¹⁷ enrolled the services of the chief engineer of the Institute of Agricultural Engineering in Harare, carefully nurtured the interest of the EU-Micro projects office in Mutare,¹⁸ and redirected the environmental activities of SAFIRE in Chimanimani district towards the Nyanyadzi scheme. Thus the NACOD network was strengthened by broaching the interest of two different donors, mobilising the necessary technical and institutional expertise and crafting a sound political alliance that included all parties that were active in Nyanyadzi. Two different trajectories were developed.

Track one: environmental rehabilitation

The SAFIRE representative of Chimanimani district directed his attention to the formulation of a master plan for the rehabilitation of Nyanyadzi as an ongoing concern of SAFIRE. In a meeting with the DA and Chief Executive officer of the RDC in February 1997, the modalities of this master plan were sorted out. The preparation of the project document would involve local experts from line ministries, saving on the employment of expensive foreign experts, whilst the presentation of the project as an on-going concern would secure funding from DANIDA, the Danish donor agency financing SAFIRE's community based environmental projects in Chimanimani. The fact that the local SAFIRE representative was an ex-Agritex employee helped to secure the co-operation of the local Agritex office. By 1998, a number of activities involving community workshops on environmental awareness, establishment of local wood lots and reclamation of the major gullies threatening blocks A, B and C were either funded by SAFIRE or under consideration for funding by the District Environmental Fund administered by the Chimanimani RDC.

Track two: securing the missing element

The second track aimed at securing the dam on the Nyanyadzi river through EU funding. The EU Micro project's office showed interest for the project, but required a proper design proposal. To that end NACOD requested the services of engineer Gotora of the IAE (Agritex). In January 1997 NACOD submitted designs for the construction of an earth dam one mile upstream of the Nyanyadzi main intake at an estimated cost of Z\$11.2 million.^{xxi} Yet, the EU representative considered the proposal too expensive: their office could only

support for the existing community gardens, and support for three goat rearing clubs (Delehanty 1995, 36-41).

¹⁶ The dam was considered too large an undertaking for APSO, whilst the borehole option was fraught with uncertainty over the availability of groundwater supplies.

¹⁷ Both the MP for Chimanimani district and councillor for Nyanyadzi ward were co-opted as members.

¹⁸ One of the project officers for the EU Microprojects programme in Mutare originated from Biriwiri. Some of his relatives owned plots in Nyanyadzi scheme.

fund micro projects to the extent of Z\$3.6 million. Next the NACOD executive asked Gotora to provide designs for the lining of the main canal. Meanwhile the Nyanyadzi IMC was clueless about the ongoing developments and approached me to find out from the EU Microprojects office in Mutare what the situation was with regard to the dam proposals. When I reported back that the EU representative was awaiting proposals from NACOD for the lining of the main canal, IMC member Nyanhanda saw his suspicions confirmed:

'Well, I have nothing against Kundhlande, he is one of us. But why can't he come out with the truth. He has a reputation as a dismissed councillor who fiddled with moneys. Can you allow such people to deal with donor funds?'^{xxii}

The IMC thought of informing their MP to bear pressure on NACOD to submit their proposals, instead of delaying matters. What the IMC wasn't aware of was that NACOD had already mobilised the MP to bear pressure on engineer Gotora to deliver the proposals free of charge in the first place.

When I met Engineer Gotora in his design office in Harare in June 1997, he was busy putting the final touches on the designs. I had offered to visit NACOD in Harare to find out on behalf of the Nyanyadzi IMC what was happening with the EU designs. Kundhlande had referred me to the office of engineer Gotora. After I provided Gotora with some flow records of the Nyanyadzi river, he wondered what NACOD was:

'Do they have any money? They asked me to put up designs to rehabilitate the main canal for less than three million dollars. But I underestimated the job. I had to send my guys twice to Nyanyadzi to do the surveys. There is a lot of siltation going on there.'^{xxiii}

Gotora elaborated three design options: lining of a limited section of the main canal with concrete, or alternatively lining of the whole canal with either PVC pipes or asbestos fibre cement. To tackle the threat of siltation Gotora included the construction of a settling basin and scour gate at the main intake as well as four dry dams on the major gullies that spilled into the main canal.¹⁹ The total cost amounted to Z\$ 4.15 million (US\$ 350,000). When I reported on my fact-finding mission to two Nyanyadzi IMC members, Nyanhanda wished to know what Kundhlande and his NACOD guys were up to. I explained Kundhlande had expressed interest in an irrigation plot for himself, and that NACOD wished to ease the impending hand over of the scheme to the users by making sure that it was properly rehabilitated first. Nyanhanda reacted surprisingly mild:

'Ahh well that is alright, him wanting a plot. But how big a plot? The hand-over to farmers is also not much of a problem. I don't see any problem anyway. The Agritex people are just sitting in their offices and that is quite alright, since we are experienced farmers here.(..) we only need Agritex for arbitration in case a plot is mischievously acquired by some person (see 8.3).'^{xxiv}

The politics of implementation

In February 1998 the NACOD secretary, Kundhlande, invited the Agritex Chimanimani office to the official presentation of the EU microproject grant at Nyanyadzi, in recognition of 'the key role your department has played in the preparation of this project and the envisaged roles you will play in its execution.'

Success has many fathers. Two weeks before the official presentation of the grant, the Rural District Council discussed the implementation of the project. The DA stressed that Agritex

¹⁹ These were ingenious constructions with a rising pipe that acted as a spillway as soon as the water level behind the dam rose above half a metre. The pipe discharged the excess water at the downstream end of the canal.

and the council should see to its successful implementation. One week before the presentation, councillor Mughido, co-opted member of the NDB, called for a meeting of the various leaders in Nyanyadzi to craft a unified voice over this thorny issue. His idea was to have the council administer the funds, whilst Agritex could supervise the actual implementation. The meeting lasted for three hours without reaching consensus. The irrigation officer then called the various leaders in his office and skilfully crafted a consensus. It was agreed that the IMC would implement the project. Somebody brought up a letter from the EU to NACOD, calling for a tender and three quotations of potentially interested contractors. The Nyanyadzi leaders unanimously agreed the contractor would have to employ local labour. All were against the company that had serviced the Odzi pumps. In the end three names of reputable companies were forwarded. The IMC members stressed they should get hold of the actual canal designs, which were with the NACOD executive.

On the 13th of March 1998, Dr Nhachi and secretary Kundhlande of NACOD arrived early at the Agritex Nyanyadzi office and were met with smiling faces from the local IMC members. Kundhlande straightaway asked the irrigation officer whether he had prepared an agenda for the meeting. This left the officer dumb-founded, since he thought he was being invited to a NACOD ceremony. After some confused looks, local Agritex staff and the IMC drafted an agenda, carefully allocating speaking time to each dignitary that was expected to come. By the time it had been completed, four four-wheel drives had arrived carrying two EU representatives, the MP, the DA and Agritex head office staff respectively. The subsequent meeting was well attended, chaired by the IMC chairman and marred by hypodermic tensions that were carefully managed by both Dr Nhachi and the DA. After the MP was introduced an old nationalist and known Ndonga activist, jumped to his feet:

'Mr Chairman, can our honourable MP rise and show himself. We don't know him, since we never see him at this place.'

This request triggered widespread laughter. Next Dr Nhachi spoke on behalf of NACOD carefully claiming ownership over the project, whilst opening the floor to discuss the modalities of its implementation. At this stage the two representatives from EU Micro projects stepped in to explain the modalities of the grant. The grant fell short of the required amount (Z\$5.6 million) to line the main canal. The short-fall (Z\$2 million) would have to be raised locally either in cash or kind (labour). A tender had to be written and widely published. Three quotations from interested companies had to be collected. Once the money had been disbursed and the actual construction started the project had to be finished within one year. The EU would send a representative to monitor progress, halfway through and at the end of the project. Whilst both representatives stressed that all stakeholders would be involved, their final remark that NACOD would compose the committee responsible for signing the letter of award resulted in a hush of silence followed by the grinding of some teeth. Hastily Dr Nhachi rose to explain that NACOD applied on behalf of all Nyanyadzi people. They had decided to work through the IMC.

The District Administrator rose next to explain the concept of accountability:

'First comes accountability. NACOD applied for the funds from the EU project office. So the accountability is with NACOD. So NACOD should sit down with the IMC and sort out how they are going to communicate and work on this project. But the responsibility and correspondence will go in the name of NACOD. The local NACOD for that matter. The implementation committee must sit down with its advisors, in this case Agritex and DWD, to approach contractors.'

After the MP had promised to bring the president to officially open the new canal in a year's time, engineer Gotora explained the basic modalities of the design he made. He explained

that he first made a design for a dam on the Nyanyadzi river, but found it was too expensive, and so he turned his attention to the main canal. He concluded by urging the Nyanyadzi community to be fast (*mhanya!* run), in order to keep abreast of inflation figures.

The top Agritex representative for Chimanimani commented that he should be included on the mailing list 'if you people want us to assist'. This comment reflected the general feeling amongst his staff that they were being by-passed. His pun was well understood and quickly rebuked by an old Ndonga nationalist who shouted:

*'We don't want Agritex to decide on the contractor. The one they use for the pumps and construction of Nenohwe irrigation scheme is useless.'*²⁰

When next a local businessman and NACOD member suggested that since NACOD had secured the project, all Nyanyadzi people should be obliged to pay annual contribution fees as he had done, the meeting exploded in anger. The usual accusations and counter-accusations were made and for a moment it seemed as if Nyanyadzi was at war again. The DA quickly intervened and called for a second meeting with the Nyanyadzi leadership to decide on the composition of an implementation committee. In the end a local committee was appointed consisting of three IMC members, one Agritex representative and one local NACOD businessman.

Evaluation: strengths and weaknesses of the urban network

After the death of chairman Gwitira the remaining NACOD leadership in Harare built a strong alliance. They succeeded in enrolling all political factions that were represented in Nyanyadzi, including the MP of the ruling party, who in turn proved instrumental in securing the cooperation of Agritex head office staff. By means of strategically placed sons and daughters of Nyanyadzi plot holders in two prominent donor organisations funds for the lining of the main canal could also be secured, though the network proved too weak to rope in the big one (a dam). Yet feedback linkages with the local Nyanyadzi constituency were rather weak, giving rise to old suspicions on the actual intentions of the NACOD leadership. I was several times requested to find out on behalf of the IMC what was happening with the dam project; the Agritex Chimanimani office remained in the dark until the very last instance; and the local NDB committee was unknown nor informed of the progress of project plans. The eventual meeting at which the EU grant was presented to the community involved a balancing act on the part of the Harare based NACOD leadership who were keen to present a unified voice to the donor agency from a community that they knew was politically divided. By the end of 1998 the works on the main canal started, but after some few kilometres of lining the funds ran out and the work was stopped again. Still the lined sections went a long way in reducing seepage losses.

8.3 THE NYANYADZI BEAN FIELD WAR: ZANU(PF)'S LAND POLITICS

The final case study looks at a third mode of ordering that draws its strength from a combination of violence and party politics. The case draws together a number of threads that seamed through the past four chapters, concentrating on the question: who is in control of the

²⁰ The general feeling amongst Nyanyadzi plot holders was that the contractor hired by government to maintain the pumps and construct the new irrigation scheme at Nenohwe was doing a bad job. Indeed construction of Nenohwe irrigation scheme dragged on for several years, and pumps that were taken for repairs took months to resurface. Yet this was probably not so much caused by bad contract work, but rather by sustained budgetary problems on the part of the government. The contractor in question went broke in 1998 as a result of delayed payments by government.

scheme? More in particular the case focuses on the question: who controls plot B19? Who is allowed to grow beans on that plot? Whilst the previous two sections have shown the strengths and weaknesses of attempts to re-work the scheme employing either the traditional or the modernist idiom, this case focuses on the political idiom that came to dominate Zimbabwe's Land Question during the late 1990s.

One of the reasons that not many Nyanyadzi nationalists have benefited from or even considered this third idiom of wealth accumulation is that Nyanyadzi bears the name of being an Ndonga opposition area. This was reflected in a speech act of Robert Nkomo, the ex-chairman of the co-operative and Methodist nationalist of the first hour. When Robert and his Methodist wife (ex-teacher at the primary school), were asked by a young woman in my presence why they did not join the newly formed association of ex-detainees,²¹ Robert responded as follows:

Robert Nkomo: Ah no! They won't give you anything. My son was married when we were toiling and I was in jail. We sat in the same room with the Mugabes and Muzendas. One day, soon after independence, Mugabe came to Mutare. Tekere²² took us from Nyanyadzi to see him. Tekere said: "These are your people." Mugabe was very happy. Tekere then asked: "What will you do about them?" Mugabe replied: "We will decide later." Nothing came later, nothing! We filled so many papers, so many forms for all these different associations, what, what. Nothing transpired. As of now I am an independent person. I don't want any party. The struggle was against having to work in the furrow without being paid and then still paying water rents on top of that. And we are complaining now, because nothing has changed. We still have to pay maintenance fees and still work on the furrows. Mrs Nkomo: We joined the party because we wanted freedom, better wages. But now we are suffering even harder. They (African leaders, AB) eat alone!^{xxxv}

A contested eviction: two narratives (1970-72)

The seeds of the case were sown in the early 1970s, when Agrícolas and Administrators converged on the need to enforce strict discipline on plot holders operating in Nyanyadzi scheme. The Agrícolas were eager to raise water rates and evict mal-performing plot holders in order to legitimise the construction of a dam and expansion of the scheme. On the other hand Administrators were busy squashing 'dissident, frothy-mouthed nationalistic politicians' through the enforcement of strict discipline and the introduction of three annually renewable permits prescribed in new legislation on irrigable areas. In September 1970, the Provincial Commissioner had remarked that if the enforcement of strict rules would result in a massive exodus of existing irrigators that was 'all to the good, as the habit of idleness and non-cooperation is so deeply engrained that we are much better off without them.'^{xxxvi} Finding replacements posed no problem in his view.

Within this context, Mwapambeni (Shuda) Marimbire, plot holder on plot B19, developed a mental illness in the course of 1970. He abused his wife, Mrs Marimbire, and in the end they settled for a divorce. Shuda left for Bocha (his original home) to seek medical treatment from *nangas* (traditional healers), accompanied by his sons Ernest and Isaac, and his daughter Tsitsi. In 1971 or 1972, Shuda was evicted from his four acre plot by the then Irrigation Manager on three grounds. Shuda had failed to pay water rates, had been absent from his plot for a long time, and did not farm his plot properly. Of the four vacant acres, one acre was

²¹ The context of this question was that War Veterans had been promised fat pensions in 1996 by the Mugabe government. In the wake of this promise many associations were formed for other people involved in the war, such as the *mujibas* and the ex-detainees.

²² Edgar Tekere was Mugabe's closest ally during the war. He later defected from ZANU(PF) since he felt the party was not living up its promises. During the 1990 general elections he contended Mugabe heading the Zimbabwe Unity Movement (ZUM), which had a large following in Nyanyadzi.

given to a certain Masasi, ultimately ending up in possession of John Chirango (plot number B164). On 28 April 1972, Temba Magoba was given the remaining three acres of plot B19, after approval by both the Irrigation Manager and headman and payment of water rates for a winter crop. In early January 1973, Ernest Marimbire, Shuda's eldest son, became aware of the change of ownership and wrote the DC, pleading permission to pay water rate arrears in monthly instalments, so as to retain ownership of the plot. The DC referred the matter to the (new) Irrigation Manager, who informed Ernest that his father had been evicted and the plot allocated to someone else.

The contestants of plot B19 broadly agree on this narrative of events. What is disputed is how Temba Magoba acquired his plot and how Shuda Marimbire got evicted. According to the Marimbire heirs, their father, Shuda, before leaving for Bocha borrowed \$70 from his 'cousin' Temba Magoba. In return Magoba would look after plot B19, i.e. crop it and pay for the water rates. Magoba defaulted water rate payments and 'developed incompetence which warranted eviction', when he was the caretaker of plot B19.^{xxvii} And so it was that Shuda Marimbire was evicted, and the Irrigation Manager officially gave the plot to Magoba.

According to Magoba he did not get access to B19 until he was officially given the plot in 1972. Magoba claims he was occupying the tail end of the scheme, using excess (drainage) water, when he was informed by kraalhead Dirikwe that he could qualify for plot B19, which had fallen vacant. Magoba also denies being related to Marimbire: his mother and the Marimbires share the same totem (*Dhliwayo*), but the two families don't share a blood relationship. On the first hearing of the case at the Agritex office Magoba admitted lending some \$20 or \$25 to Shuda Marimbire, but later he denied having done so.

In 1975 Shuda Marimbire returned to Nyanyadzi, where he died in 1977. Widow Marimbire, Ernest, Isaac, Tsitsi and their spouse repeatedly presented their claim on plot B19 to the local government office. In 1987, the Irrigation Manager, embarrassed by the case, issued half an acre of land (plot B172) to the widow.²³ Sometime in 1996, the Marimbire heirs revived their claim to plot B19.

Flogging a dead horse: Agritex' impotence to resolve the case (August 1996 – April 1997)

On 3 August 1996 Temba Magoba was summoned by kraalhead Dirikwe in connection with a complaint by Ernest Marimbire that plot B19 belonged to his father. The kraalhead, failing to reach a conclusion, forwarded the case to Headman Gudyanga's court. On 22 September, the Headman, considering Magoba's June 1972 water rate receipt, ruled in favour of Magoba and directed his hand-written verdict to 'the leader of Agritex Nyanyadzi.'^{xxviii} On 4 November 1996, the irrigation officer for Nyanyadzi confronted his fellow Chimanamani officers with the case:

'What are my powers concerning eviction of plot holders? What do we do with plot holders that were evicted during the colonial time? How does this office react to a court ruling of headman Gudyanga?'

The officers, including the DAEO, couldn't provide him with clear answers. All were aware that colonial Irrigation Managers could evict mal-performing plot holders, but they were not sure whether those powers were still vested in their office. The legal status of the 1983 DERUDE policy was unclear. The Irrigation Officer was advised not to re-consider eviction

²³ The official registry book of Nyanyadzi scheme records this allocation to Mrs Marimbire as 'late comer: 10/3/87'.

cases that dated from the colonial era. That would be tantamount to opening a 'can of worms'.^{xxix}

On 18 November 1996, Isaac, Ernest, Tsitsi, Mrs Marimbire and her two daughters in law paid a visit to the Agritex office to claim their plot, relating their story to the Irrigation Officer. The latter decided to call in Magoba to hear his side of the story on the same day. All parties, including three IMC members, reconvened on the 2nd of December 1996. The meeting reached an impasse, since explanatory records were not available in the office. The Irrigation Officer adjourned the meeting to search for more documented evidence on the exact circumstances surrounding Marimbire's eviction. When on 16 December 1996 the parties reconvened, 'someone had already tipped off the IMC' on the three letters written in 1973 by Ernest Marimbire, the DC and the then IM. The Irrigation Officer had kept those letters to himself, but was forced by the IMC to read them out aloud. Since the official register of plots (the Kalamazoo) contained no exact information on the transfer of ownership, these three letters combined with the receipt of the water rate payment by Magoba in April 1972, were the only written pieces of evidence. Whilst this evidence had sufficed in the headman's court, it did not satisfy the Irrigation Officer, who withheld his judgement. Magoba, picking up rumours on a sexual relationship between the Officer and one of the Marimbire sisters,²⁴ feared for the worst and wrote a letter of complaint, arguing his case, to all Agritex officers in command of the local, district, provincial and national office. Thus the matter extended beyond the local realm. In an explanatory letter dated 24 January 1997, the Irrigation Officer noted he could not tilt 'the scales of justice to either party', and forwarded the case to the Agritex district office.²⁵ He had discussed the case with the top Provincial Agritex officer, who had promised to take the matter to the Provincial Governor. The other avenue that lay open was to forward the case to the Rural District Council, the legal custodian of irrigated land in communal areas.

In January 1997 another letter of complaint was received at the provincial Agritex office. In the letter one of Magoba's sons, who was with the notorious 5th Brigade Tank Squadron,²⁶ accused the Irrigation Officer of unjust behaviour towards his father, wanting to reallocate his father's plot after 25 years of fruitful cooperation with the scheme's management.²⁷ In response another meeting was held at the Agritex district office. It was resolved that Agritex should stay clear of the conflict and refer the matter to the Rural District Council.

²⁴ These rumours were widespread. The B19 plot wrangle drew a lot of attention in Nyanyadzi, because of its potential ramifications. Many plot holders feared for claims by heirs of evictees on their own plots, in case the Marimbires succeeded in winning their plot back. The rumours on the officer's sexual relationship with a Marimbire sister were confirmed by all Agritex Nyanyadzi office staff and many plot holders in Nyanyadzi. Some extension workers alleged the officer had destroyed written evidence to tilt the scales in favour of the Marimbires. It is important to note that the officer's relationships with both the Nyanyadzi community and his own staff were strained (see chapter 6).

²⁵ The Irrigation Manager claimed he could not clarify what happened to plot B19 between the supposed date of eviction of Shuda Marimbire (1970) and the allocation of the plot to T Magoba (June 1972). The Kalamazoo was silent on this issue. Furthermore the IM regarded T Magoba's testimony inconsistent on the issue of lending money to Shuda Marimbire (admitted by Magoba on 18 November 1996, but denied again on 2 December 1996).

²⁶ The North Korean trained 5th Brigade of the Zimbabwe National Army is notorious for its ruthless suppression of the Matabele led insurrection during the early 1980s (see CCJP 1997).

²⁷ In arguing his case against the Officer, the son referred to the early 1994 cut of water supply to the scheme, reported in the local press on 25 February 1994. The loss of crops, which resulted from the incident, was popularly ascribed to the Officer, since he gave the fatal order to move the maintenance gang from the Odzi pump station to the main canal.

During an April 1997 workshop attended by Agritex Manicaland staff and the ZIMWESI research team, the issue of evictions cropped up and was discussed at length. The Provincial Agritex Chief observed first of all that there was no irrigation policy:

'The roles that we played are assuming colonial powers, but at the moment we can't implement them. (...) We have recently come across two cases of evicted people claiming back their land. Now, I wonder whether one of the researchers can help us here. Did one of you find in literature any reference to whether we can evict plot holders?' (Manzungu et al. 1997, 16)

In reply, I highlighted that the control of irrigable areas regulations were gazetted in 1972, but that the DERUDE 1983 irrigation policy document, which refers to these regulations, was never gazetted. According to the Chief Irrigation Engineer from Agritex Head Office this meant Agritex could evict plot holders, if only the scheme was re-gazetted under the regulations now contained in the Rural District Council Act. The deputy Provincial Agritex Chief was less convinced, referring to the failure of the 1989 eviction exercise in Nyanyadzi (see 6.2). Yet another Irrigation Manager, saw no need for re-gazetting. In his view, as long as the Control of Irrigable Areas regulations had not been repealed, they were still in force (Manzungu et al. 1997, 17). At the final session of the workshop the issue of evictions once more cropped up. The Irrigation Officer for Nyanyadzi wished to know whether he could 'evict people, yes or no?' The Chief Irrigation Engineer from Head Office once more stressed that irrigation schemes would be gazetted on request, so as to enable the Control of Irrigable Areas regulations to come into force.

Mobilising allies: violence versus the Rural District Council (April – June 1997)

Sometime in April 1997, a small delegation of the Chimanimani RDC visited Nyanyadzi to meet with Magoba and the Marimbires. However, since most of the Marimbires did not attend, the meeting remained inconclusive. Another meeting, on 7 May 1997, between Council officials and the plot contestants ended in a brawl. Eileen and Tsitsi Marimbire cursed the officials and left the meeting. Two days later the Marimbire brothers destroyed half an acre of Magoba's beans on plot B19, by ploughing it under. Magoba reported the loss of his beans to the Nyanyadzi Police station. The Marimbire brothers were arrested the same day, but were released again after a brief interrogation. By now the 'bean field war' was on. The conflict between Magoba and the Marimbires became the talk of the day in Nyanyadzi. On 19 May 1997, the Irrigation Officer wrote once more asked his direct superior for the exact contours of his mandate and pressed for the gazetting of the scheme:

'It seems of late that Agritex ground staff finds it very difficult to show its executive powers if at all it should have such powers for effective schemes management. It seems we operate from nowhere and every Tom and Jack claims responsibility over affairs of the scheme. Chief, kraalheads, IMC member, political figures councillor - all these want final says in the running of schemes. Could this be put very clear to communities i.e. their limits in the operation of schemes. In the history of the scheme, could your office facilitate location of information pertaining to the gazetting of the schemes and possible re-gazetting.'^{xxx}

Meanwhile, the Rural District Council rejected the Marimbire family's claim on plot B19, recognising Magoba as its legal occupant.^{xxxi} A tug of war ensued on plot B19. The Marimbires planted some groundnuts, which Magoba duly ploughed under. Next, the Marimbires permanently invaded the plot. On the 25th of June the Marimbire brothers planted 10 *bunds* of wheat and 16 *bunds* of maize. To irrigate the plot they diverted water from the furrow without seeking permission from the water bailiff. Whenever Magoba approached his plot, he was forcefully chased away by either one of the posted Marimbires.

Entering the legal arena (June 1997 – May 1998)

On June 30th, the Chipinge Court found Ernest, Isaac and Stanley Marimbire guilty of malicious injury to property (beans) of Magoba. The Marimbires were sentenced to pay Z\$400 fine each, in addition to Z\$8,000 compensation to Magoba. Failure to pay before September 30th would result six months imprisonment with hard labour. However, when Magoba went to the Nyanyadzi Police station to complain about the Marimbires invasion of his plot, the Police claimed they could do nothing. The Court verdict only ruled on the destruction of the bean crop, without specifying the issue of plot ownership. The Council resolution was found to be lacking in detail.^{xxxii} Magoba decided to go to Court to establish his right to occupy plot B19. The persistent conflict was causing deep embarrassment to all parties involved. The Rural District Council at some stage decided to take up Magoba's case and provide him with legal backing through Bere Brothers Legal Advisors. Thus the case of Chimanimani RDC versus the Marimbire family was lodged with the Mutare Magistrate's Court.

Meanwhile, Magoba found more allies in Nyanyadzi scheme itself. During a ward meeting on 23 July, the councillor for Nyanyadzi lashed out at Agritex for failing to deny the Marimbires water on the contested plot. These remarks met widespread approval. In desperation, the Officer wrote to Council, denying condonation of the Marimbires and absconding responsibility: 'administrative issues are your (RDC – AB) responsibility. And as such your office is invited for arbitration.'^{xxxiii}

On 11 November 1997, the Magistrate's Court ruled in favour of the Rural District Council in absence of evidence provided by the Marimbires. The next day the Irrigation Officer ordered his subordinate to compile a register of 'plot wrangles' in order to save 'time and energy in flogging dead horses'.^{xxxiv} Apparently he acted on the assumption that the Magistrate Court's verdict put an end to the B19 wrangle. That was not the case. Chibune and Mahaso, legal practitioners acting on behalf of the Marimbires wrote to Bere Brothers, representing Council, requesting 'consent to rescission' of the default judgement in Court. The former argued they had applied for postponement of the Court hearing, to allow for time to collect all affidavits. The Marimbires were 'not in wilful default' and needed to be heard in Court to resolve the matter fairly.^{xxxv} Bere Brothers informed their legal colleagues they would oppose the rescission.^{xxxvi}

In spite of their defeat in Court, the Marimbires expanded their field operations. Plot B164, which had also originally belonged to their father, was invaded. On plot B19 a nice stand of green mealies was ripening off. A messenger of Court, seeking to apprehend six goats from the Marimbires in compensation for their failure to pay the fines slapped on them by the verdict of June 30th, returned empty handed. On 11 December 1997, the Magistrate's Court passed its final judgement on the case, favouring Magoba as represented by Council. A month later, Bere Brothers, on behalf of Magoba, urged the messenger of Court to take action and eject the Marimbires from plot B19 or alternatively 'destroy their crops'.^{xxxvii} Finally, it seemed the Marimbires would have to clear off.

But then, another twist occurred. Another ally was mobilised. On 3 February the clerk of the Magistrate's Court issued a notice of Opposition to the court's ruling of 11 December 1997. Thus, the judgement was nullified. Bere Brothers jumped into action:

'We note with great concern and shock, that the Notice of Opposition has already been issued and smuggled into the record, yet (...) has not been adjudicated upon by this honourable court yet. (...)

unless if you want us to believe that this honourable court is now practising "Kangaroo" procedure.^{xxxviii}

It is not clear how the Court dealt with this protest. Meanwhile, the messenger of court had been rebuffed again in early February 1998. He had come to 'destroy crops in plot B19, but did not do so because Magoba refused to accompany him.' In yet another meeting of the IMC and Agritex office to discuss the foiled visit of the messenger of court, the IMC absconded any responsibility for the case, on the dubious ground that they had never been involved in it.^{xxxix} On 19 February 1998, Bere Brothers requested the member in charge of Nyanyadzi Police station to provide the crime registration number that was issued in connection with the destruction of beans by the Marimbire brothers. The deadline for payment of fines and compensation had passed, and Bere Brothers hoped to entice the clerk of Court to 'issue the necessary papers for the imprisonment of all the accused persons who are in gross contempt of the court order.'^{xl} On 14 May 1998, the messenger of court, assisted by four members of Nyanyadzi Police destroyed the Marimbires beans crop on plot B19. However, they failed to apprehend the Marimbire brothers. Magoba again urged for a meeting to resolve the issue and regain access to his plot.^{xli}

A network of a higher order: ZANU(PF)'s politics of invasion (end of 1998)

On 22 September 1998 the final nail in Magoba's coffin was delivered. On that day, the Minister of Lands and Agriculture, who also happened to be the ZANU(PF) party chairman for Manicaland province, issued a written order to the director Agritex, containing one sentence:

'Can you please normalise ownership of plot B19/24 Nyanyadzi irrigation scheme in Chimanimani to Mrs Marimbire.'^{xlii}

Suddenly the matter had moved beyond plot B19, to include plot B24, occupied by two of Magoba's sons. The order reached Nyanyadzi one month later. The Irrigation Officer referred the 'hot potato' to his superior awaiting 'guidance on this issue.'^{xliii} The Agritex Chimanimani office passed the buck onto the Rural District Council, who in turn forwarded the matter to the Provincial Administrator.^{xliv}

The after-math: transfer of the IM and demise of state control (1999-2003)

When I visited Nyanyadzi scheme in January 2003, the Marimbire family was still occupying plot B19. A number of other plots in the scheme had been invaded by heirs of evictees. The proceedings in the case of the B19 plot dispute bear semblance to the larger scheme of events unfolding in Zimbabwe at the end of the 1990s. The method of violent invasion of land, legal battles and political arm-twisting of court orders, became the order of the day after mid-1998. In Nyanyadzi, the outcome of the plot dispute provided the final straw for the Irrigation Officer. In June 1999, he requested for a transfer out of Nyanyadzi citing 'animosity of the local community towards him'.^{xlv} In September 1999 he was transferred to his native province, Masvingo.

8.4 CONCLUSION: RE-APPROPRIATION AND EMERGENT USER ORGANISATION

The cases presented in this chapter provide a new view on the contradictory events taking place in Nyanyadzi. Rather than confirming prevalent Agritex' ideas that emphasise the failure of Nyanyadzi's divided users to manage their own affairs, the cases present the contours of three different idioms of appropriation and concurrent modes of user involvement in the scheme. These emergent forms of user organisation and management not only open the

black-box of Nyanyadzi scheme, but also provide lessons for future policies of irrigation management turn-over.

Opening the black-box of Nyanyadzi: different idioms of appropriation

The two cross-generational accumulation patterns identified in chapter seven not only informed different ways of using the scheme, but also structured the appropriation of various parts of the water-network and emergent modes of user organisation.

In block C the traditionalist idiom has not only allowed the leading royal clans to claim a say over the allocation of land and water in the area surrounding the irrigated perimeter (chapter 7), but it has also given rise to effective forms of user organisation taking care of the maintenance of the canal and marketing of tomatoes. Critical in the success of this user organisation is the authority of kraalhead Nyanhanda and his uncle, the clever manipulation of different counter-discourses (political, ancestral and managerial) by the kraalhead, and the fact that the 35 irrigating clans of block C are bound up through intermarriage.

In contrast, the professionally employed sons and daughters of modernist plot holders organised themselves in an urban based association (NACOD) aiming to improve the ailing water-network in Nyanyadzi through the mobilisation of donor funds for the construction of a dam. Whilst NACOD was initially ineffective because it was suspected to represent the interests of big business and the Ndonga opposition, the premature death of their 'tainted' chairman allowed the crafting of a strong alliance that included members of all political colours and strategically placed relations in two prominent donor organisations. Through this alliance NACOD managed to secure funds for the lining of the main canal.

Finally a third mode of appropriation can be distinguished (treated in 9.3) that became more prominent after the launch of the third *Chimurenga* in 1997, and draws its strength from a political accumulation strategy. This pattern can be observed among former freedom fighters (comrades) and their relatives. It is a pattern that is not based on agricultural accumulation of wealth or investment in education. Rather it depends on who you know within ZANU(PF). The latter is informed by participation in the war, affiliation to the Party, or kinship relations with the present-day *Chefs*. Few people in Nyanyadzi have been able to pursue this way of moving up. The people who did, played a role during the liberation war and got their dividends paid out in the form of a post in the government machinery or by benefiting from war pensions.

These three emergent forms of accumulation and appropriation resonate with pathways of wealth accumulation and organisation that occur in other parts of sub Saharan Africa. The NACOD network of urban sons and daughters of Nyanyadzi irrigators resembles similar urban based associations in Nigeria and Ghana, where cocoa producers invest agricultural proceeds in the education of their urban based children (Berry 1985, 1993). The traditional clan based organisation of block C irrigators resembles the dominant organisational mode of indigenous African irrigation furrows (Adams *et al.* 1997). Finally, the politically informed strategy of wealth accumulation and appropriation of public property comes close to the politics of the belly, as described by Bayart (1993), where access to jobs, opportunities and assets depends on who your patron is and whether s/he has a share of state power.

Different patterns of appropriation by insiders and outsiders

In this chapter and the previous chapter different modes of appropriation have been observed between autochthonous irrigators, operating within a traditional idiom of accumulation, and

modern, immigrant irrigators. These differences are in line with findings reported from irrigation schemes elsewhere. Magadlela (2000) for instance identifies contrasts between immigrant irrigators and local dry landers in relating to, and appropriation of, Nyamaropa irrigation scheme in Nyanga district. Over time, the local dry landers came to regret their choice not to join the scheme. After being offered the opportunity to access irrigated land in a new block, they started to re-appropriate the scheme by invoking a cultural repertoire of belonging to the place combined with a purported mastery over ancestral spirits. The locals' mode of organising contrasted sharply with the modern, Christian repertoire espoused by the immigrant irrigators, providing similar contrasts between clan and nuclear family based irrigation as observed in Nyanyadzi. These findings are of wider relevance than Zimbabwe alone. In the Office du Niger, in Mali, a similar differentiation can be observed between autochthonous plot holders and those who were either forced by the colonial government or by the drought conditions of the 1970s to join the scheme. Amongst the 'immigrant' plot holders a more favourable attitude to adopt green revolution packages and focus the household's production strategy on the irrigated plot prevailed, whilst amongst the original inhabitants a variety of livelihood options was pursued, including irrigated gardens outside the scheme's official perimeter (*hors cashier*), rain-fed cultivation, and investment in extensive livestock herds (Kater *et al.* 2000).

Revisit of the hydraulic property thesis: from a sense of ownership to ownership

Many donors and policy makers stress the need for user participation in the design, construction and management of smallholder irrigation schemes so as to increase 'their sense of ownership', an attribute that is deemed essential for effective community management of these schemes. What the Nyanyadzi case shows is that rather than attaining just the sense of ownership, various users employ different cultural repertoires and mechanisms of *claiming* ownership. The mobilisation of labour by kraalhead Nyanhanda to maintain the main canal not only filled the gap left by a retreating government, but also served to claim ownership over the canal and the water it carried. Thus an effective split of the Nyanyadzi water-network was set in motion, whereby the clan based irrigation network in block C could claim priority of use of Nyanyadzi river water over the irrigators located in the downstream blocks. The urban based network of sons and daughters of modernist plot holders in blocks A, B and D have tried to reclaim the integrity of the scheme as one whole and claim their share of Nyanyadzi river water by mobilising EU funds to line the main canal. Thus without an official hand-over of the infrastructure, ownership has shifted from the government to the users.

These different manifestations of investment in hydraulic property has not only changed the relationship between Nyanyadzi irrigators and their water-network, but also reconstituted the basis of their relationship with the managing agency (Agritex). In the case of the original MuNyanyadzi irrigators, presently located in block C, the process has come full circle. They started off with a community scheme of plot owners who invested their labour both in the construction and maintenance of the frail MuNyanyadzi water-network. This changed after the institution of water rent payments in 1936, extinguishing community property through the creation of a government scheme and demoting the African plot owners to the status of tenants (plot holders). But sixty years later the descendants of Pirani Nyanhanda and intermarried clans residing in block C reclaimed their part of the water-network as a community scheme by investing a variety of social (labour), cultural (traditional authority), and political (ZANU(PF) affiliation) capital.

Emergent user organisation: lessons for irrigation management turn-over

What lessons for turnover of the water-network to its users does this study contain? First of all the evidence provided in this chapter points at the need to look beyond formal organisational models such as the one contained in the Irrigation Management Committee. Whilst a disproportionate amount of attention in Zimbabwe has been paid to the need for legally constituted IMCs (Chitsiko 1995, Makadho 1990, Meinzen-Dick *et al.* 1993) and sharply defined user responsibilities (by-laws), emergent forms of user organisation on the ground have shown the limited relevance of the IMC as an articulation of user interests. Rather than organising and strengthening the IMC, Nyanyadzi's users have engaged in a variety of emergent networks that take care of different aspects of irrigated agriculture. The IMC is only mobilised when political splits threaten to obstruct developments that are beneficial to all, like in the case of the implementation of EU micro project.

Strengths and weaknesses of emergent forms of user organisation

The Nyanyadzi community harbours a variety of leaders that draw on allegiances that are both fluid and informed by past events. This can be observed by comparing the strengths, weaknesses, accountability mechanisms and degree of collective action espoused by the emergent forms of user organisation in Nyanyadzi.

The strength of the clan-based network in block C is that it is capable of mobilising labour from all plot holders and successfully market tomatoes grown under contract for many years in a row. Both activities are sophisticated expressions of collective action that require a certain amount of trust and control over free-riders. The trust and control were provided by the traditional authority of kraalhead Nyanhanda, who carefully crafted a strong alliance amongst the other clans, wresting control over the area from headman Matyashe. The alliance dates back to the days of the MuNyanyadzi scheme, was sealed by ongoing inter-marriage, and spans even across the river to an area administered by another chief (Mutambara). Yet, the weaknesses that come with clan based authority are equally clear: the leading royal clans (Nyanhanda and Jena) have appropriated the best land for furrow irrigation along the Nyanyadzi river, and opportunities for women to access land are limited to rain-fed land and small garden plots (see chapter 7). Thus a patriarchal process of socio-economic differentiation has been set in motion. The clan based network is also not strong enough to prevent ongoing siltation and degradation of the main canal, since the area next to the canal is under the control of a rival female kraalhead of the Matyashe clan. Finally it can be observed that the network is limited in scope to the area under direct control of the two leading clans. Within the scheme as a whole and more particular amongst modernist plot holders in blocks A, B and D there is no support for a complete take-over of the scheme by the traditional leadership.

The urban based network of NACOD espouses different strengths and weaknesses. It originated in Harare and drew highly educated and professionally engaged sons and daughters of modernist plot holders together. What they shared was a historically grown leaning towards the Ndonga opposition and the capacity to organise and articulate plans for the improvement of the scheme, independent of government. Their public identification with the opposition initially worked against them as testified by accusations of working for big business, and wanting to hand-over or appropriate the scheme. Yet the strategic location of their members in donor organisations and the learning process embarked on culminated in the crafting of a strong alliance that crosscut political allegiances and institutional boundaries.

However, the accountability structure of their organisation was quite limited, confined to mostly modernist plot holders that make up the old guard of nationalists in Nyanyadzi. During the formulation and negotiation process surrounding their plan to construct a dam and line the main canal, feed-back linkages with the Nyanyadzi community and Agritex were weak or non-existent. Thus the formation of an implementation committee at the presentation of the EU grant became an instant act of crafting consent in a suspicious and divided community.

The cases presented in this chapter call for a careful appreciation of local leadership allegiances, before the modalities of the user organisation (Water User Associations, IMCs) are decided upon. A flexible, learning process approach towards their formation is more likely to produce effective forms of user organisation.

Knowledgeable gate-keepers who have internalised the system

Any future form of user management will most certainly include the employment of water bailiffs. The critical role played by water bailiffs in distributing the water and providing a source of information on matters pertaining to agricultural production is widely acknowledged by plot holders of various orientations in Nyanyadzi. This preference is shared by irrigators in other schemes in Zimbabwe (Manzungu 1999, Senzanje and Van der Zaag 2003). The fact that bailiffs are often accomplished farmers themselves, drawn from the ranks of fellow irrigators, helps to increase their knowledge of both the social, agricultural and technical intricacies of the water-network. Yet, their status as fellow irrigator limits their capacity to mediate water related conflicts. This raises the question to who water bailiffs should be accountable. On this point Nyanyadzi irrigators differ of opinion. Whilst in block C the water bailiff is part of one of the royal clans that preside over a network of inter-married clans and thus accorded status, in the other blocks the water bailiff has to derive his authority from other sources. Kenya Dube, the productive advanced master farmer (chapter 3) and water bailiff for block B-South, did so on account of his political impartiality and standing as a good farmer. Yet, experience from other community managed schemes such as Mutambara shows that the same royal affiliation that strengthens the authority of the block C bailiff, can be used to favour access to water by members of the royal lineage (Manzungu 1995, 1999).

The energy equation in smallholder irrigation

Smallholder irrigators tend to economise on energy costs. All Nyanyadzi plot holders, whether located in block C or associated with NACOD, have indicated a strong preference for improving the gravity water supply to the scheme, to the extent that the need for a dam on the Nyanyadzi river has grown into an *idée fixe*. Several outsiders, including myself, have proposed in the past to sink boreholes in the Odzi river bank with pumps fitted on them (one for each irrigated block) so as to mitigate the scheme's recurrent water woes (Bolding 1996, Delahanty 1995, Tiffen 1990a). Yet, this option was disapproved by a majority of Nyanyadzi irrigators, as was clearly demonstrated when the APSO consultant suggested this solution to the NACOD executive. It is not just the need to pay for recurrent electricity bills that Nyanyadzi irrigators dislike, but also the dependency on outside agencies that comes with the pump technology, in case of a breakdown or maintenance. The willingness of plot holders in blocks A, B and D to pay for the pump electricity bills in July 1996 was only forthcoming on the (mis)understanding that they would get the money back from the DWD at the start of the next financial year. The collection of money to settle monthly electricity bills requires an effective institution capable of excluding free riders (*cf* Ostrom 1992, Van Steenberghe 1997). So far none of the official institutions in Nyanyadzi has proven to be capable of doing that. The IMC has been ineffective in controlling side-marketing of beans grown under

contract and Agritex has proven itself equally unfit for the task as demonstrated in the case of the B19 plot wrangle, when they could not control the illegal occupation of the plot or deny water to the Marimbire family.



Photo 15: Staff members of the Mupfure Catchment Council in front of their office, 1998
(Source: Alex Bolding photo)

INTERMEZZO 2

SHIFTS IN WATER GOVERNANCE? WATER MANAGEMENT AND USE AT CATCHMENT LEVEL

During the 1990s the dominant policy discourse on natural resource management stressed the need for holistic approaches. It was recognised that in the case of water the river basin, or catchment area, was the 'natural' unit for water management (Wester and Warner 2002). All forms of water use and the effects produced by such use are hydraulically inter-connected at the scale of the river basin. The conundrum of increased demands for water (for new users such as growing cities and expanding industries), dwindling supplies (due to overabstraction by existing users and degradation of the resource base) and changes in the quality of the water supplied (due to pollution, salinisation and siltation) has produced increased tensions amongst various users at basin level. In some river basins 'closure' has occurred, fuelling fears of looming 'water wars' in the near future. To counter the emerging threat of 'hydrocide' (Lundqvist 1998) policy makers have searched for new forms of hydro-solidarity amongst the various water users (Falkenmark 2001, with Lundqvist 1998).

The situation in Nyanyadzi catchment provides a case in point, reflected by the increased levels of competition over its water amongst various users. From its inception Nyanyadzi scheme was confronted with its hydraulic dependency on the catchment upstream through recurring water shortages and the amounts of silt the river deposits each year at the main intake. This intermezzo first presents three major shifts in water governance that occurred in international policy circles. Thereafter the modalities of the old and new Water Act are presented, including some characteristics of the water reform process (1993-98) that incorporated elements of the internationally endorsed shifts in water governance. Chapter nine assesses to what extent the existing and new policy models achieved sustainable capture and management of Nyanyadzi water.

GLOBALLY ENDORSED SHIFTS IN WATER GOVERNANCE

In the 1990s a new consensus on water resource management has emerged, which is presently promoted by international funders and global coalitions of interest such as the Global Water Partnership and World Water Council. The new consensus incorporates three shifts in water governance and the institution of integrated water resources management strategies, defining the basic modalities of legal and institutional reforms presently undertaken across the globe.

Three shifts

Global discourses on the existing water crisis have emphasised the need to reconstitute the basis of water management. Three shifts in water governance have been endorsed by international funding agencies and policy making bodies (World Bank 1993, Cosgrove and Rijsberman 2000). In southern Africa, newly created governing institutions embody three profound shifts: (1) from state to market-driven regulation; (2) from centrally administered to

democratic user-based management institutions, and; (3) from administrative to resource-based management. River basins have thus become the operational unit for water management, thereby cross-cutting existing administrative boundaries and political constituencies.¹ Although resonating neo-liberal and institutionalist ideals of open markets and stakeholder participation, the legitimacy and accountability of the newly formed governing institutions is, in reality, highly problematic (Barham 2001, Kaufmann 2002, Rhoades 2000, Wester and Warner 2002).

The three shifts in governance are informed by a rational choice paradigm that relies on universally valid principles of legitimacy, accountability and democratic representation. A number of criticisms can be levelled against such a conceptualisation.

The democratic representation model *assumes* that water management is a rational choice exercise, where different values and norms attached to various water uses can be commensurated. Similarly, politics are often *assumed* to be bracketed in multi-stakeholder partnerships. In reality such bracketing of interests, power differentials, and value orientations rarely obtains (Cleaver 2000, Edmunds and Wollenberg 2001, Espeland 1998, Moore 1990; Steins and Edwards 1999).

Informing the privatisation discourse is an economic conception of human agency, captured in service delivery models and institutional design principles, that fail to appreciate how accountability is recursively structured by the social norms and cultural perceptions of involved actors (Giddens 1984). This requires looking beyond economic incentives and service-client relations, to include an empirical study of social interactions as they are actively and strategically pursued by individuals, communities, official agencies and informal networks (Long 1989a), as well as a historically, culturally and politically informed understanding of resources, rights and entitlements (Mosse 1997).

Decentralisation entails a reconfiguration of domains of bureaucratic power and responsibilities, and consequently of changing forms of accountability and state control, rather than the mere devolution of power to lower levels. Water bureaucracies have been particularly resourceful in maintaining their command-and-control orientation under the guise of apparently drastic institutional reforms (Ferguson 1990, McCool 1994, Rap *et al.* 2004).

Integrated water resource management: five areas of integration

Concurrent with these shifts in governance the need for integrated water resource management strategies is emphasised (Barrow 1998). What remains a mystery in the writings of many advocates of the integrated approach is what exactly should be integrated. Mollinga (2000, 18-22) identifies five possible fields of integration: (1) integration of different uses of water involving trade-offs between industrial, domestic, mining, agricultural, and ecological water needs; (2) integration of analytical and policy perspectives, which are presently characterised by a strong disciplinary and sectoral separation; (3) integration of different institutions responsible for water resources development and management; (4) geographical

¹ Earlier attempts to plan, develop and manage water resources in an integrated fashion at river basin scale were informed by the purported success of the Tennessee Valley Authority (TVA) in the USA (Lilienthal 1944). In the 1960s and 1970s many TVA inspired river basin authorities were established in Ghana, Niger, Nigeria, and Kenya. Whilst these river basin authorities have played a critical role in the construction of new dams and large scale irrigation schemes, they were generally ineffective and unsuccessful in achieving socially, economically and environmentally sustainable water management strategies (Adams 1992, 1999, Scudder 1989).

integration that links resource use and transfer between upstream and downstream users; (5) integration of water resources development and management into a broader agenda of rural transformation and poverty alleviation.

Often advocates of integrated water resource management focus on the first area of integration, whereby the outcomes in terms of water allocation principles differ according to the disciplinary rationality that is assumed to be of critical importance. Thus water engineers emphasise efficient use and conveyance of water, economists favour allocation of water to its most productive use, and environmentalists emphasise the ecological integrity of the resource. So far, it has proven difficult to come up with a common yard-stick (rationality) that is commensurate with the different values and norms that are attached to various types of water use by the stakeholders involved (Espeland 1998, Espeland and Stevens 1998).

THE ZIMBABWE EXPERIENCE: OLD AND NEW MODELS FOR CATCHMENT MANAGEMENT

Before zeroing in on the process and characteristics of the Zimbabwe water reforms, an attempt will be made to trace the origins and emergence of the old model of managing water at catchment level. This will be done through a legal conceptual lens. Despite the fact that irrigation and water use practice often precedes legal recognition, legal frameworks provide useful analytical insights in the theoretical ramifications between water and other resources (including human resources, i.e. individual actors and institutions) and the regulation of its use by means of material, financial and organisational procedures (technologies of control). Early water legislation reflects the shifting interests of the nascent Rhodesian settler state, from an initial rush for mineral deposits to an increased appreciation of water as the critical resource for agricultural development. Water became the liquid gold that was found lacking in its fixed deposited form.

Water legislation before 1927: the riparian versus the prior appropriation doctrine

Prior to the promulgation of the Water Act of 1927, a situation existed where no single authority was responsible for water control and regulation (Robertson 1928). Whilst primary water use (i.e. use for domestic purposes) by both Africans and Europeans was safeguarded in the 1889 Royal Charter of the British South Africa Company (Wurzel 1987, 266), other water uses were regulated by the riparian doctrine enshrined in British Common Law (McIlwaine, 1936, 788). Stripped to its essentials, the this doctrine stipulates that only those who have access to land riparian to a stream have the right to abstract water from it (Teclaff 1996, 362). This rights system puts the onus on the individual land owner, which was soon considered unsatisfactory.²

In particular, the amount of litigation in the Union of South Africa due to attempts by private companies and state agencies to secure water for mining, urban areas and irrigation, at some distance from natural rivers, caused a stir in Rhodesian policy circles (McIlwaine 1936). Legal instruments instituted in 1908 and 1910 respectively secured preferential water rights for the mines and railways over other riparian users. Local authorities requiring water for town supplies could request such by means of a special Act. After a long debate (1911-13) in the Legislative Assembly, it was decided to depart from South African precedents and the riparian doctrine and vest all public water in the State, prescribing conditions on which it should be apportioned to users (McIlwaine 1936, 789). The Water Ordinance of 1913

² For instance, in times of scarcity upstream riparian land owners could dry out downstream water users. Also, the riparian doctrine does not provide for water transfers to areas located far from natural rivers and streams.

allowed water rights to be issued for irrigation purposes after consideration by an itinerant Water Court, consisting of a water judge and two assessors. The amended Water Ordinance (1920) fully embraced a doctrine of prior appropriation inspired by Dutch-Roman Law, engraining the principle of 'first come, first served' during times of scarcity (Weinmann 1972, 102). Finally, in the Water Act of 1927, authority to grant water rights was centralised in the Water Court (Robertson 1928, 45), abolishing preferential treatment to mines and railways.

Principles of the 1927 Water Act

The basic principles of the 1927 Water Act remained in force until its amended version of 1976 was repealed and replaced by a completely new Act in 1998, discarding the prior appropriation doctrine. Gould (1988, 5) provides the following concise definition of an appropriative right:

'An appropriation gives the appropriator the right to divert a specified quantity of the flow of a stream, at a particular point on the stream, for use for a particular purpose, at a particular place, provided the water is not needed to satisfy appropriations acquired at an earlier date.'

This definition identifies the parameters of a water right enshrining legal principles, that reflect a particular mode of ordering flowing water and its use in space and time (box ii.1).

The Water Act further specified a number of procedures, facilitating administration of the Act's principles, thus recursively tying offices, papers, experts, officials, land, water and water users together in a uniform, standardised process. The more relevant procedures are highlighted below.

A water right application has to be lodged on a standard form to the Water Court. The Court consists of a water judge, and two assessors, one government hydrologist and one person on the voters roll for the Legislative Council, appointed by the Governor (McIlwaine, 1936). Alongside the application, two reports have to be submitted. A government hydrologist reports on the water availability in the stream and existing water rights which may be affected by the application. A second report establishes the beneficial use of the future appropriation, and in the case of irrigation water is normally provided by an agricultural officer.

To prevent undue clashing between grant holders at the lower end of a river system and grant holders on minor tributaries at the upper end of the system, the Water Court may 'fix an area within which the rights of priority shall operate' (Robertson 1928, 48). Whilst acknowledging hydrological inter-dependency of water use in a river system, ultimately this clause was used to carve the country and its major river basins up into hydrological zones for administrative ease.³

To enforce state ownership of public water and allow monitoring by the Police and other authorities, unlawful water abstractions were considered a 'criminal offence' (McIlwaine 1936, 799). Whenever a water right application affected the primary water supplies of Africans the Native Commissioner could object on their behalf in the Water Court.

³ Another legal clause allowed for the formation of river boards in such self-contained areas. These water user bodies would 'arrange for the equitable division of water (...) and by this means unnecessary friction and wasteful use of water among grant holders will be avoided' (Robertson 1928, 49). After Independence these river boards, made up of European grant holders, provided the means to defend entrenched rights to water, whilst allowing further infrastructural development through so-called dam syndicates.

Box ii.1: Key principles of the Water Act (1927)

The 'first come, first served' principle provides a *modus operandi* for the allocation of water in times of scarcity, drawing on the widespread human trait of 'queuing'. Straight from the beginning appropriation was tied to the possession of private land. Only those with title deed (i.e. European farmers) could apply for an appropriation. Those whose land was held in trust (the vast majority of Africans in so-called Reserves) could only apply through a competent authority in custody of the land (Native Commissioner) or government controlled command area (Department of Native Agriculture). To suit the purposes of the settlers, and ignore prior uses of river water by Africans, the principle was transformed in Rhodesia to 'first applied, first served'. Assuming a *tabula rasa*, existing water use was not acknowledged, until such time as an application was forwarded to the administering agency.⁴

In honour of the capricious nature of water, an appropriation allocates a quantified amount of instantaneous flow, rather than a fixed volume of water. The onus lies on the grant holder to monitor abstraction rates by means of a measuring device. Stored water, in dams, is temporarily removed from the hydrological cycle of flowing water, and for that reason different principles apply, i.e. storage rights and so-called agreement water (stored in government dams, and sold by the Department of Water Development at a raw water price). Groundwater is not regulated by the state, but in ownership of the overlying, riparian land owner.⁵

The principle of beneficial use acts as a safety valve against water speculation and over-appropriation by senior appropriators. To protect junior appropriators, flow rights are limited to beneficial use, normally specified by regulating the quantity and time of water used, i.e. the rate of diversion, and evaluated in terms of the purpose of use the appropriator wishes to make with water thus made available. Beneficial use is evaluated by government experts.

A water right is further defined by specifying the point of diversion, place of use and purpose of use, since the rate of diversion does not fully explain the effect of an appropriator's use on stream flows. This effect is compounded by the point of diversion, amount of water diverted, times of diversion, return flows produced,⁶ place and time when return flows enter the stream, and other factors. In most cases, and certainly *anno* 1927, limited understandings of stream hydrology, lack of information on soils and groundwater flows, as well as the costliness of acquiring such information, precluded the exact definition of water rights by directly specifying the effects on stream flows produced by actual use (Gould, 1988, 10). Thus, points of diversion, place of use and purpose of use are crude approximations of the dynamic nature of water flows.

Another relevant principle engrained in the law, not related to water abstraction, is the prohibition of cultivation within 30 metres of the river bank. Streambank cultivation, or *matoro* wetland cultivation, was considered an environmental hazard, producing excessive siltation and reduced base flow. The Natural Resources Act of 1941 enabled the imposition of penalties on perpetrators of streambank cultivation.

⁴ Guelke and Shell (1992) report on *trekboers* in South Africa during the 17th and 18th century, using similar mechanisms to alienate land and water from the *Khoikhoi* tribe. Lacking legal and military mechanisms, the *Khoikhoi* had no means to defend their entrenched rights to land and water.

⁵ The non-regulation of groundwater abstraction provided a serious 'leak' in the public water allocation system. Those capable of drilling a borehole and capturing the water, before it entered a public stream, had a definite advantage, particularly in times of water scarcity.

⁶ In most cases not all water abstracted is actually consumed. Some of it returns by means of percolation, seepage and groundwater flow, back to the stream, available for use by downstream appropriators. However, return flows vary according to use. Urban water supply systems produce less return flow than irrigated command areas situated alongside a public stream. In Rhodesia such return flows were usually ignored, by assuming full consumptive use of the water allocated, and defining seepage of water in furrows as waste.

The problems of administration of the Act: limited span of the water-network

Whilst the Water Act of 1927 neatly defined the procedures and socio-technical ensembles surrounding water use across the country, its actual span was quite limited to start with. The two caveats that allowed for establishment and expansion of the network, namely treating illegitimate water use as a criminal offence and allowing grant holders to monitor and police themselves by means of river boards, did not carry very far. Nine years after enactment of the new water legislation, the first Water Court judge, McIlwaine, observed that '(o)ften, especially in remote parts of the country, use is made of public water for irrigation and other purposes without any authority.' (McIlwaine 1936, 801). River boards were not yet in existence. Expansion of the network hinged on the growth of its administering government agencies.

The first irrigation engineer was appointed in 1910. His assistant, Eng Robertson, became the first hydrographic engineer in 1918, forming a branch within the Department of Irrigation responsible for collecting hydrographic and meteorological data (Weinmann 1972, 101). By 1925 this branch operated six fully automated gauging weirs and 15 manually monitored flow recording stations on major rivers in the country (Weinmann 1975, 144). By 1930, rainfall was recorded in 530 locations (Weinmann 1975, 143). The hydrological knowledge base and administration started to grow in earnest after the conclusion of the second World War, when the country experienced a great influx of new settlers. By 1951 the Department of Irrigation had grown into the largest department within the Ministry of Agriculture and Lands, employing 212 officials located at head office, three circle offices and two branch offices across the country. In 1950 the hydrological flow recording network consisted of 48 fully automated and 44 manually operated stations (Weinmann 1975, 144). By the time of Independence (1980) close to 12,000 flow rights had been issued and research had generated basic insights into potential water yields from each hydrological zone (Wurzel 1987). The capacity to monitor abstraction of water was greatly expanded after the establishment of the Natural Resources Board in 1942, and the deployment, after 1944, of an army of Land Development Officers and Agricultural Officers within the Departments of Native Agriculture and CONEX (1948) respectively. Government subsidies and favourable loan packages helped greatly in establishing a nation wide network of dams and irrigation schemes within European areas.⁷

The water reform process (1993-98)

At Independence the distribution of the public water resources of Zimbabwe was even more skewed than that of land. The commercial farming sector controlled most of the flow rights and a sizeable part of the stored water (in private dams). Moreover, the skewed distribution was in principle permanent and had been a result of an unfair advantage enjoyed by the European settler farmers who had claimed water first. After the 1992 drought, the worst ever recorded in the country, the Water Question gained political expediency and questions were raised on its inequitable distribution. In 1994 the government announced its intentions to build one medium sized dam in each district every year, a promise that could not be kept (Magadzire 1995).

These concerns informed the ensuing water reform process, which started in 1993 with the appointment of a Water Resources Management Strategy (WRMS) steering group within the Ministry and a Water Act Review Board appointed by the Minister. The Board organised

⁷ For an overview of government subsidies and loans extended to the commercial farming sector for the construction of irrigation and water conservation works from 1923 - 1957 (see Bolding *et al.* 1999, footnote 4).

consultative meetings with various stakeholders in each Province and presented its recommendations to the Minister in January 1994. The Board found that a number of clauses within the 1976 Water Act allowed for redistribution of water resources to the smallholder sector and allowed for reprioritising water use during times of scarcity.⁸ However, maladministration of the Act by the DWD and Minister resulted in missed opportunities.⁹ The Water Act Review Board recommended the reservation of 10% of the Mean Annual Run-off in government dams for use by smallholder farmers (Mlambo 1994). However, this reservation combined with the backdating and transfer of 10% of all water rights to the smallholder sector was only announced by the Minister in April 1995, when another drought affected the country and general elections were due. The announcement was not accompanied by a commensurate pledge to provide funds to develop the necessary water infrastructure to abstract the promised water.

The water reforms gained new impetus after a consortium of bi-lateral donors decided to support the process by means of expatriate staff in the Ministry and financial support for the ailing WRMS secretariat. Thus the three shifts in water governance highlighted above became pivotal elements of the reforms. Water was to be managed on the basis of the eight major river basins in the country and decentralised to catchment and sub catchment councils that comprised stakeholder representatives (see Photo 15). Furthermore it was proposed to privatise the Department of Water Development and substitute it with a parastatal called the Zimbabwe National Water Authority (ZINWA) that would sell water from government dams and institute levies.

To test some of the modalities of the new water Act two pilot projects were established in Mupfure and Mazowe river catchments and funded by the Dutch and German governments respectively. The pilot catchment councils (then known under the name of Catchment Authorities) comprised two contrasting ways of organising stakeholder representation. Whilst the Mazowe council had been established at the instigation of commercial farmers and strongly influenced by the modalities of the existing river board, the organisational modalities of the Mupfure catchment council were strongly influenced by a number of Dutch expatriates and progressive engineers within the Ministry (Bolding 1998, Derman 1998, Moyo 2000, Nhira 1997). The shadow of ZINWA was forecast upon smallholder irrigators in pump-operated schemes in July 1995, when the responsibility for paying electricity bills was devolved from the DWD to the smallholder irrigators themselves (chapter 6).

Meanwhile the formulation and drafting of successive versions of the new Water Bill (1996-98) was done in-house and through a limited number of stakeholder workshops. The most drastic changes were effected in the 5th draft Bill and comprised the vesting of executive powers in the Minister (rather than in a Board of Stakeholder representatives) and the appointment of an executive Catchment Manager, heading the new Catchment Councils, and capable of overruling any of the decisions taken by the council. The formulation of the ZINWA Bill, inaugurating the new Water Authority, was done completely in-house. During three separate parliamentary sessions in 1998 both Bills were read and passed without

⁸ These clauses were later acknowledged by a deputy director of the DWD (Chatora 1995) and the President of the Water Court (Matinenga 1996). By means of catchment outline plans, DWD staff could re-allocate water from existing right holders to newcomers. During times of scarcity, the Minister could declare river catchments as water shortage areas, temporary suspending existing water grants, and directly influencing water allocation.

⁹ Matinenga (1996, 7-8) mentions two instances of maladministration involving large scale commercial farmers who had illegally constructed major storage dams in heavily committed catchment areas.

noticeable changes (Manzungu 2001). In 1999 catchment councils were established across the country. The process of formulating an Integrated Water Resources Management strategy was marred by delays and conflicts between the donor consortium and the chairman of the WRMS secretariat. The resulting water resources management strategy (2000) broadly reflected the principles endorsed by the international community.

Principles of the 1998 Water Act

The new Water Act and institutional dispensation comprised a number of fundamental shifts, some of which are highlighted in table ii.1.

Table ii.1: Principal changes enshrined in the Water Act of 1998

Old Water Act 1976	New Water Act (1998)
Water rights granted in perpetuity	Water permits of 20 years
Priority date principle abolished	Proportional water allocation
Limited control over groundwater abstraction	All forms of water become state controlled
Management by DWD and river boards	Management by (sub) Catchment Councils (SCCs)
State responsible for clean water	Polluter pays
No reservations for environmental water use	Environment accepted as legitimate water user
Water is a public good	Water is an economic good (introduction of pricing and levies)

Sources: Manzungu *et al.* (1999, epilogue), Gonesse (2002).



Photo 16: Signpost in Ruwedza valley, 1996
(Source: Alex Bolding photo)

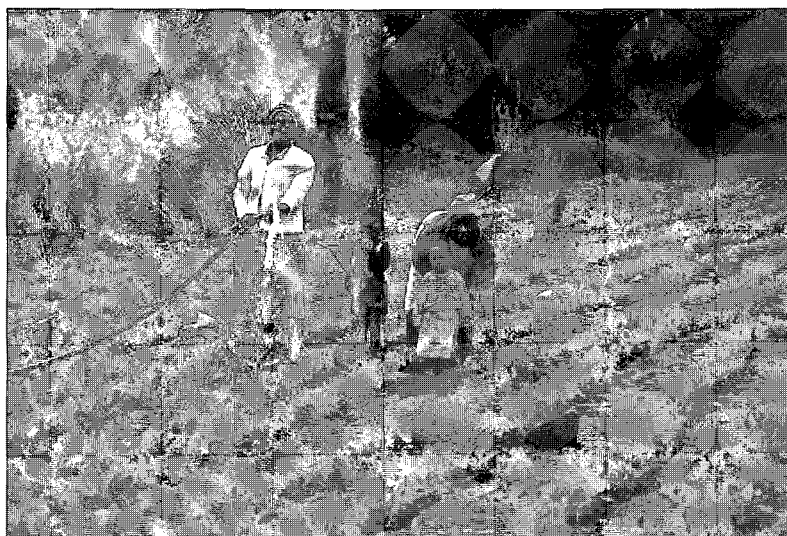


Photo 17: Women irrigating in Ruwedza Valley, August 1997
(Source: Alex Bolding photo)

CAUGHT IN THE CATCHMENT: FARMER FURROWS AND RAIDS¹

The basic idea for this thesis, the linking and integration of water use and management at three different hydraulic levels, was inspired by my participation in an upstream raid organised by the irrigation manager of Nyanyadzi scheme in May 1994. The raid represented an attempt to forcefully bring Nyanyadzi river water to the scheme's intake, leaving a swath of destroyed irrigation furrows in its wake. The destructive raid was legitimised by the Water Act of 1927, which provided the basic mode of ordering water use at a catchment scale, inspiring the official water-network (9.2). This network was initially geared towards capturing the resource water for Rhodesian settler farmers, through the application of the prior appropriation doctrine. When forced to deal with water scarcities this network produced discriminatory features and depended for its implementation on a strong monitoring agency that lacked in Nyanyadzi catchment.

In contrast, as section 9.3 shows, the 'illegal' farmer initiated network of irrigation furrows builds on indigenous water and land use practices that are informed by a wide array of available cultural dispositions emphasising the public nature of river water, more aptly reflected in the riparian water abstraction doctrine. Whilst actively suppressed during settler rule, the network was quick to re-emerge and establish itself after independence, presenting a formidable competing force with official water users in the catchment. This set the scene for the occurrence of upstream raids (9.4). The raids reflect attempts by the official water-network to get to grips with increasing competition over scarce river water. However, the post-independence political dispensation as well as the nature of flowing water worked against the emergence of an effective mechanism to share Nyanyadzi's water amongst its different users. The only tangible effects produced by the raids were the creation of awareness amongst the various water users of their hydraulic interdependency and the gradual inclusion of furrow irrigators in the official network (through the allocation of water rights).

A case study (9.5) on the development and management of a network of irrigation furrows in the remote Ruwedza valley demonstrates the strengths and weaknesses of an indigenous paradigm on catchment water management. The paucity of state interventions in Ruwedza have allowed the emergence of water use principles and practices that come close to the professed ideals of integrated land and water management pursued by international policy actors. Various social, material, and agro-ecological characteristics of the furrow network pay tribute to the capricious behaviour of water. Yet the network is limited in span and subject to collapse during periods of duress, such as the extreme water scarcities experienced in 1992 and 1995 and the increased population densities caused by ongoing settlement of newcomers.

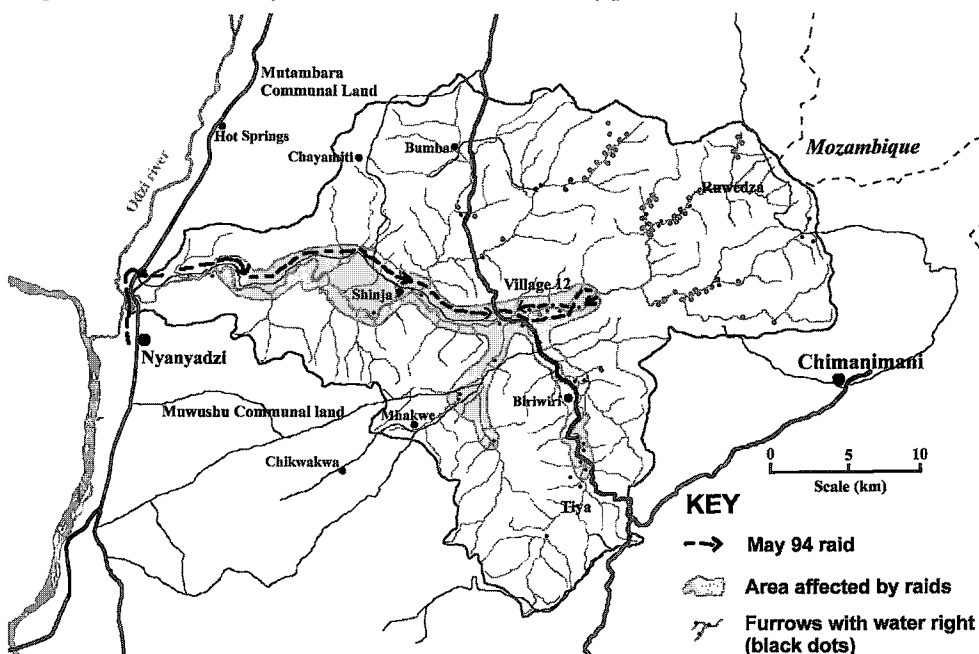
¹ Parts of this chapter have been published earlier in Bolding *et al.* (1996) and Bolding (1999).

The conclusion (9.6) draws out the time-space characteristics as well as strengths and weaknesses of the different water-networks that emerged in the catchment. Finally some lessons for the impending water reforms are drawn.

9.1 CAUGHT IN THE CATCHMENT: THE MAY 1994 UPSTREAM RAID

I arrived at the Nyanyadzi Agritex office just after 8 *am*. The out-going irrigation manager of Nyanyadzi irrigation scheme had phoned the day before, inviting me to join him on 'an interesting exercise, necessary to bring water to the scheme.' Nyanyadzi river had slowly dried up in the previous weeks, leaving the scheme, and block C in particular, with no water to irrigate.

Map 9.1: Route of the May 1994 raid and areas affected by previous raids



Departure and road up to Shinja resettlement scheme

The atmosphere in the 3-roomed office block is frenetic, very different from its usual heat stricken quietness. The most senior extension worker, Richard, is in the room next door, trying to make radio contact with the Birchenough office of the Natural Resources Board (NRB). In front of the office stands a truck which is surrounded by Agritex general hands equipped with shovels. When Richard comes through to Birchenough, the irrigation manager shouts some instructions through the radio. Despite the fact that the NRB officer is out of office, the irrigation manager believes we can go ahead, his assistant is there. The irrigation manager fetches me and we board the truck. There is some discussion among the extension workers on who has to join the coming exercise. In the end the irrigation manager picks the most junior of his extension staff, Sydney, since he has to gain experience in 'these things, because it won't be the last time.' The 39 casual workers and NRB assistant join us in the back of the truck. The councillors of Nyanyadzi (Mugido) and Shinja ward (Matyashe) sit in front of the truck.

On the tarred road from the office to Nenowhe a police car passes us. We stop for a moment. There is some confusion. Are those our police officers? We proceed as the car makes no signs of stopping. At the Nyanyadzi police station we pick up two police constables. The irrigation manager explains that he had to fill in forms stating why the policemen were needed. He had already warned me of possible violence over the phone, the day before.

On our way upstream along the Shinja road there is an exhilarated atmosphere among the Agritex general hands. They point at certain spots along the Nyanyadzi river where apparently illegal water abstractions are made. Such places are marked by lush banana trees and vegetable gardens. Just past Nenowhe we stop. A small man approaches the truck running. He turns out to be a block C irrigator. The irrigation manager indicates that we have to take him with us: 'I like that'. After crossing the Nyanyadzi river by the Chimanimani road bridge we turn left into Shinja resettlement scheme and stop. On our right hand is a gathering of farmers under a tree. The irrigation manager, the two councillors, two policemen, me and Sydney get out of the truck and walk to the place.

An unexpected encounter

Extension worker Toto and Village Development Committee (VIDCO) chairman of village 12, Mr Siraha, look very surprised to see all those persons with a truck breaking into their meeting. We sit in a half circle, with the two policemen and the women slightly apart. At first there is a long spell of silence allowing everybody to monitor the group and look for familiar faces. Then Mugido, the Nyanyadzi councillor, raises his fist and opens with the ZANU(PF) slogan ('*Pamberi ne ZANU(PF)!*').² Everybody joins in this ritual. Next, the councillor explains the mission of the NRB and the prevailing system of water rights that was devised to share the available water and control illegal poaching of water. 'The District Administrator and councillors know of these procedures. They consider where the water can be used to its best avail'. After Mugido has taken his seat again a senior farmer (Marowa, owner of an irrigation furrow near the bridge) stands up and opens with the ZANU(PF) slogan. He asks the VIDCO chairman whether he was aware of the coming of these officials. The chairman replies he was not notified. Councillor Mugido responds that they did not notify the VIDCO. 'It is just a cross check of things that are happening with the water. No special notification is needed for that'. Both the extension worker and a farmer from the group concur that the visitors are free to say what they want to say. Next, the NRB assistant takes the floor:

'We came here once with the District Administrator to discuss the water problem.'³ Now we have come for a follow up of that exercise. We want to see whether everyone has got a water right. Normally you use water for two weeks and then let it flow downstream. However we have noticed that you are not doing so. The next time we come and find such disarray we might give you tickets and fines.'

Next in line is Matyashe, the councillor for neighbouring Shinja communal area:

'I apologise for coming without notice. We did not come to destroy whatever you are surviving on. We are here to teach each other on the best way to use water together. We bring the word of the government through the governor to enlighten everybody on this. It is not allowed to farm in the river banks. Some persons are reported to have blocked the whole river. We want to notify

² 'Forward with ZANU(PF)!' These slogans are commonly used in resettlement schemes during public meetings of a developmental nature. At *pungwes* (nightly rallies) of freedom fighters during the war these slogans substituted the traditional hand-clapping ritual paying respect to the local Chief. In communal areas the traditional hand-clapping ritual has remained more popular than the party inspired slogans. In this particular case the use of the ZANU(PF) slogan is used to assert legitimate (government) authority.

³ The NRB assistant refers to earlier raids in 1987 and 1991, when the District Administrator mediated in the water conflict. A water sharing arrangement was then agreed and instituted (see 9.4).

those people who are taking water illegitimately first and may act the day after that. You are supposed to be down in your fields but now we found you here. Let me stress that everyone who is using water should notify the NRB first.'

Then it is the turn of irrigation manager to say something. He does so reluctantly:

'I did not know that there was water in the river. I can only give comments after having seen blockages in the river. I thought there was no water at all. We want all who use the water to come out so that we can teach each other on its use.'

Matyashe asks whether there are any questions. A farmer rises and says that he has got a water permit dated 13 October 1993. Whilst he has not yet lined his furrow, he has taken water from the river: 'It is good that you explained your aims. Otherwise you would have broken all furrows in the river. Some have water rights, you know.' To this, the NRB assistant reacts as if stung by a bee: 'You have a permit to dig a canal, but not yet to extract water from the river. You had a broken furrow. But did you repair it? Because there was a lot of leakage and other people were taking water from your furrow.'

The farmer replies that he 'failed to refuse others to take water from the furrow.' Another farmer raises informing the officials where his furrow is, so they can go and check. He admits that he is not yet through with the procedure of attaining a water right. He uses a provisional water right. The NRB assistant, who has remained in standing position, replies that he should refrain from using water till his papers are through. Other farmers rise and explain their position with regard to attaining a water right. Some have a water right, some still lack a water measuring device, others are in the process of applying for a provisional water right. The NRB assistant addresses them all sternly: 'You all wait till you get that water right!' One woman indicates that she has got a water right, but that others on her furrow may not have one. The NRB official scolds her: 'How can you join people without a water right then? Some people who say that they have got a permit only got a permit to construct a furrow.' One man refutes this point: 'The furrow was already constructed when we got the land. We had to get the permit to use it.' The NRB official swallows his pride and tries to appease the agitated crowd by promising that those who are not ready with the official arrangements might be granted a water right 'next round'. Councillor Matyashe explains the farmers how to proceed from here: 'Everyone should be in his fields and explain his story when we go and close off the water.'

March of destruction

After the meeting people disperse in various directions. The irrigation manager, local extension worker and two councillors walk in the direction of Marowa's homestead, near the bridge. Sydney and me enter the truck together with the NRB assistant. The truck moves on through the narrow road, until it can go no further. It stops under a tree along the Nyanyadzi river. From there we proceed across the river, go up the hillside and after walking for at least one hour in a hasty tempo we see the river valley down the steep hillside. In a long single file we climb down through the forest on the hillside. Down at the river we cross through bushes and rocky patches. Finally we stumble across the first furrow. Sydney notes that there is no gate and concludes that this is a clear indication that the owner doesn't have a water right. He orders the gang to destroy the stone weir in the river and block the furrow with stones. The labourers line up across the river passing on stones from the weir to each other, dumping them in the furrow intake. Others are busy destroying the sandy banks of the furrow. The owner of the furrow, the VIDCO chairman, protests meekly, waving with some official papers.

We proceed downstream and stumble on another furrow. The VIDCO chairman has also followed us. Sydney tells me he distrusts the VIDCO chairman. Despite his story at the meeting, he does not have a water right. I approach him and ask him about his feelings. He says that actually the visitors are quite right in what they do. Even when I tell him that this exercise pains my heart as an irrigation engineer, he sticks to his opinion that it is rightful what happens now, though his crops will wither as a result. But this second furrow presents a different case, he thinks. This furrow does have a gate. Nevertheless, the labourers start destroying the weir of the furrow. The VIDCO chairman quickly takes Sydney and the NRB official some 100 metres downstream along the furrow, where a small measurement structure can be found. Just upstream of the V notch a bifurcating drain takes off towards the river. Sydney discusses the V notch for a long time with six users of the furrow (2 women, 4 men), the block C cultivator and the NRB man. At a certain moment the VIDCO chairman leaves the scene in disgust. One of the furrow users shows his provisional water right dated 20 June 1988 and extended till 31-12-1994. He is entitled to use 84 m³ of river water a day. Sydney explains that this is a provisional water right. He should first line the furrow with cement up to the V notch, in order to control the water losses up to his point of extraction. Furthermore the V notch should have been calibrated and endowed with a gauge that shows exactly how much water is abstracted. The furrow irrigators rebuke that a colleague of Sydney, their local extension worker, has installed the V notch. The latter told them they had thus fulfilled their obligations. But now, Sydney tells them something else.⁴ Slowly the comments from the furrow irrigators die out. They realise their case is lost: the furrow intake has been destroyed.

We proceed our path of destruction. Two more furrows are closed. The furrow irrigators with their provisional water rights are simply over ruled. What strikes me about the fourth furrow is the way it is excavated through a rocky formation. It is an impressive piece of engineering. In a way this furrow is naturally lined. Some of the labourers board the truck on its way back to the bridge. Sydney, me, the NRB official and a few die-hards proceed our way straight through gardens, sugarcane plantations and densely grown reed marshes in the river beds. Some of the labourers start to remove plants from the river bed, but Sydney stops them explaining that the purpose of our visit is to provide water for Nyanyadzi irrigation scheme. The illegal stream bed cultivation will be dealt with later by the NRB. We stumble upon a fifth furrow. I notice a man who makes notes in a small booklet at each furrow we close. He is the block C chairman of the Zimbabwe Farmers Union. He tells me that he takes notes to be able to report on the success of the raid to the block C cultivators.

A sixth furrow is closed. This is Marowa's canal. A flume has been installed at 50 metres from the lined intake canal. Sydney has the intake destroyed nevertheless, the gauge for reading the discharge passing the flume is lacking. After getting stuck in some densely grown marshes, we proceed through the vegetable gardens and irrigated land of Marowa. We enter the most beautifully irrigated portions of land I've come across in Zimbabwe. Marowa has cultivated all land around the ruined house of the former white settler, which includes a swimming pool. Paw-paw trees meander through the dilapidated walls of the Cape Dutch mansion. The seeds of independence are overgrowing past glory. Marowa greets us running down from his new house and leads the labourers to his garden that is lined with sugarcane, *madumbe*, banana trees, and paw-paws. He cuts sugarcane for them. I am impressed by his stand of cotton, beans, tomatoes, and other legumes. Whilst we were pursuing our path of

⁴ After the earlier raids in 1984, 1987 and 1991, the local furrow users approached their extension worker to apply for a water right and get the proper devices installed. The extension worker helped them to the best of his knowledge, but never realised a gauge was required too if the V notch was to work as a water measuring device (see 9.4).

destruction, Marowa has entertained the councillors and irrigation manager: the truck is overloaded with fruits from his garden.

At the bridge over the Nyanyadzi river we gather again as a group. The amount of water flowing down has increased. The labourers point at their success. I shrug my shoulders and ask 'for how long?' They laugh at this remark. Sydney says they will take care of the rest of the river tomorrow. In total seven furrows have been destroyed today. On the way back to Nyanyadzi we discuss the situation along the river. Sydney agrees that those small irrigators might win in the end. Their land is better situated than block C, their soils are better for irrigation than the sandy soils in block C and their furrows can be more efficiently used than the leaking main canal in Nyanyadzi. However at the heart of this exercise lies the historical situation and political configuration of this moment. Block C can claim to be the first scheme with a water right in Nyanyadzi catchment, dating back to 1937. As such it can claim priority over other (legal and illegal) irrigators.

Significance of the May 1994 raid

The net result of the upstream raid of 11 and 12 May 1994 was some two days of slightly increased river flow to Nyanyadzi irrigation scheme. Then the flow dropped again to a mere trickle. The 1994 winter season did not produce any crop for block C plot holders. The upstream furrow irrigators were quick to air their anger to the local administration and equally fast in rebuilding their stone weirs. What the raid shows is that Nyanyadzi irrigators, both formal and informal, legal and illegal, are keenly aware of their hydraulic interdependence at a catchment scale. They do not need water experts or the global water policy discourse to point at the usefulness of a catchment perspective in water management. They are caught in it. The raid also shows the level of competition over river water in Nyanyadzi. Water is indeed a highly contested resource. Furthermore the raid shows that the debate over legitimate use of water is couched in terms of papers (water rights) and material artifacts (V notches, gauges and gates) that supposedly reflect legality. However, the resilience of upstream furrow irrigators points at conflicting perceptions of legitimacy and the concurrent need for legality. The very fact that a raid was necessary to match reality with legality indicates the lack of an overall monitoring institution that can enforce the existing legal framework on the ground. Exactly how this situation came about is the subject of the remainder of this chapter.

What the above raid tells us is that statutory Acts don't act by themselves. Rubber-stamping informal furrow irrigators as illegal, does not make them disappear. To draw water from a river and put it to meaningful use requires more than some legal affidavit. At best, a Water Act defines the procedures, material, financial, and social conditions that have to be met to become a legitimate water user. As such it reflects a particular *mode of ordering*. Rather than imposing order by itself, the Act defines a process of sociotechnical ordering that involves a myriad of human and non-human actors: a Water Court, a hydrologist, an agronomist, a river inspector, a farmer, a river, a furrow and other material artifacts like levelled land, water measuring devices, gates, and most important of all flowing water. The purpose of a Water Act is to order or regulate access to water, particularly at times when scarcities occur. The Nyanyadzi raid has shown that this formal mode of ordering, enshrined in the Water Act, is actively contested by upstream irrigators. Legality is but one aspect or effect of a water-network. The raid demonstrates the existence of more than one water-network in Nyanyadzi catchment. There is the formal, legally endorsed network of government institutions, hydrologic gauging stations, officially recognised plot holders and their irrigation scheme which is endowed with a water right entitling it to priority of use over other users of water

from the same river. At the same time another network of informal furrow irrigators, with or without water rights, is abstracting Nyanyadzi river water under a different understanding of what legitimate water use entails.

9.2 THE ESTABLISHMENT OF THE OFFICIAL NETWORK IN NYANYADZI CATCHMENT

Rhodesian water administration and African irrigation

The Water Act left its first imprint on Nyanyadzi catchment in 1934, when Alvord applied to the Water Court for a water right to the first MuNyanyadzi right bank furrow (see 4.1). However, this did not imply that the MuNyanyadzi furrow was the first irrigation venture that drew water from the Nyanyadzi river. As highlighted in chapter 1 the European settlers that arrived in the Melsetter Highlands often took out an irrigation furrow first on their newly acquired farms. By 1915, 220 hectares of European land in Melsetter district had been brought under irrigation, constituting 10% of the irrigated acreage for the whole country (Weinmann 1972, 100).

Initially Alvord was unfamiliar with the official procedures to acquire legitimate access to water for the African irrigation ventures he initiated. As far as the government agencies administering the Water Act concerned this feeling of unfamiliarity was mutual. Alvord was opening up virgin ground with his African irrigation projects. African irrigation ventures, prior to the MuNyanyadzi furrow, had acquired water rights in the name of their instigators, i.e. the local Mission station in the case of Mutambara (1912) or the local NC in the cases of Mutema (1931) and Zimunya (1933) furrows.⁵ The latter two furrows had originally been conceived under the community irrigation scheme policy drafted by Alvord. In such schemes, individually specified water rights had been promised to those shareholders providing (free) labour during construction of the furrow. As late as 1937, Alvord issued individual water rights to plot holders in Mutema, depending on the amount of labour months worked.⁶ However the community irrigation policy and registration of water rights in individual Africans' names was soon abandoned.⁷ For MuNyanyadzi furrow Alvord, for the first time, requested the CNC to apply for a water right at the Water Court. The Water Court duly granted a provisional water right to MuNyanyadzi Project in the name of the CNC.⁸ However, the Water Court insisted on cement-lining of the canal and measurement of the water losses incurred during conveyance, before granting a final water right for the irrigation of 56 acres, in 1936.ⁱ

For the big Nyanyadzi project on the left bank of the river, Alvord requested a water right capable of irrigating 1,000 acres in winter and an additional 1,000 acres in summer. The irrigation engineer supporting the application was optimistic, asserting that the size of the

⁵ In the case of the first irrigation furrow constructed under the aegis of Alvord himself, the Zona furrow on the premises of the Mt Selinda Mission station in 1921, it is not clear whether any water rights were issued at all.

⁶ Ten months or more of labour entitled a shareholder to free water rights for life on four acres. Four months or less of labour only gave a free right for one acre for 4 years or less, after which the shareholder would have to pay an annual rate for the use of water. NAZ, S2814/3585, Report on Mutema Irrigation Project: assignment of water rights, sent by Alvord to CNC, 9 February 1937.

⁷ In Mutema the company scheme model was abandoned after the government had mobilised and paid for repair labour to rehabilitate both Mutema furrows, seriously damaged by the 1942 summer floods. The Zimunya (Nyachowa) project was the only African community irrigation scheme to evade government control (Roder, 1965, 108).

⁸ Alvord had erroneously claimed in his application that the Nyanyadzi river was entirely located in the Reserve: 'no European farms will be affected.' This might have helped in getting a water grant.

scheme was only limited by the amount of water Nyanyadzi river could supply, which was ample, considering local gaugings of 13 to 14 cusecs (370–400 l/s) during its supposed lowest point of supply, in November 1936.ⁱⁱ The presiding Water Court judge (McIlwaine) was more wary of such a large African irrigation scheme and the possible negative effects it could have on irrigating European farmers. Whilst granting ten cusecs (283 l/s)⁹ of Nyanyadzi river flow in a provisional water right, the judge at the same time limited the priority of the Nyanyadzi project grant 'to the upper boundary of the Muwushu and Mutambara Reserves.' This limitation meant that 'an allocation of water may be made in the future to a farmer above the Reserves, which will not be subservient to this right.' Through this clause, the judge opened the way for European settler farmers in the upper reach of Nyanyadzi catchment to claim their share of Nyanyadzi river water, irrespective of the needs of African plot holders located in the Nyanyadzi project. The Water Court also ruled that:

*'it would not be justified in making further allocations of water for such schemes [African irrigation schemes, AB] until assured that full advantage is being taken of those already in the area concerned.'*ⁱⁱⁱ

This clause put a lid on Alvord's ambitious plans to develop more African irrigation schemes in the Save valley. The onus was now on him and his demonstrator staff to prove that the Nyanyadzi project grant was being utilised to the fullest extent. At the time of judgement, however, Alvord did not think much of these exceptional clauses: the Nyanyadzi river was thought to be a reliable partner ('a perennial river') and initial reluctance on the part of African cultivators to go for irrigation could be overcome, as previous irrigation ventures had proven.

Closure of informal African furrows: 1938–1951

On 7 October 1938, a British South African Police (BSAP) trooper on patrol up the Nyanyadzi river discovered that the river stopped flowing before reaching the scheme's intake. He had some ideas on the nature of the problem:

'The natives up the river have dug a number of small furrows to irrigate their gardens with. The largest garden seen was about three acres, but there was not much growing in it. The water runs through the gardens and back into the river again.'^{iv}

The assistant NC Melsetter informed his superior in Chipinga of this report and reports received from Nyanyadzi project staff that the river flow had dropped to such a low level, that only one acre could be irrigated every 24 hours. He suggested an investigation by an engineer from the Irrigation Department.^v Alvord followed this up and reported to the CNC that the rainfall in the past year had only been half of normal, and therefore

'a few small furrows along the river will make a decided difference in the water in the river, even if, as stated, the water in these furrows flows back to the river. This playing around with small private furrows should be prohibited as no water rights have been granted to the individuals using these furrows and a priority right has already been granted to the Nyanyadzi Furrow project. If any Natives in the Reserve wish to do irrigation they should be required to take plots on the Nyanyadzi Project.'^{vi}

Alvord added that African furrow irrigation was also rife in the Biriwiri and Mhakwe tributaries to the Nyanyadzi river. The CNC ordered the NC Chipinga that it was

⁹ This flow right reflects the standard appropriation that was granted to flow diversions for irrigation purposes, i.e. 1 cusec (28.3 l/s) per 100 acres (40 ha) of irrigated command. Whilst this allocation (0.7 l/s/ha) may have suited irrigated crops in the middle and high veld, where most European irrigation was concentrated, it is on the low side for the hot conditions prevailing in the low veld. In Nyanyadzi allocations of 1 l/s/ha would be more appropriate.

'undesirable' that Africans interfered with the flow of the river. This order presumably sealed the fate of the African furrows.¹⁰

However, in 1947, another drought year, some 16 unauthorised African irrigation furrows were discovered in the Mhakwe area. The Land Development Officer in charge of Nyanyadzi was quick to blame these irrigating Africans for the lack of flow to the scheme. The NC Melsetter, after having the culprits brought into his office, lectured them on the fact that Nyanyadzi project plot holders paid an annual rate for their water and were the only legitimate water users, since their project was endowed with a priority right. He subsequently invited them to take up plots in Nyanyadzi. This they refused to do, according to the NC, since they would then be 'under control and discipline.' The NC pleaded with his provincial superior that 'I have been anticipating some complaint as result of my action in closing these furrows and I should appreciate your support in the matter.'^{vii} The PNC duly obliged, supporting closure of the furrows and referring to the neighbouring Umvumvumu river catchment where similar unauthorised furrows had been discovered.¹¹ The PNC added that the Africans concerned were at liberty to make an application to the Water Court. Alvord, hospitalised at the time, concurred on the course of action, adding that:

'All private enterprise in this connection, should be discouraged; and any native wishing to undertake irrigation should be encouraged to take up land at one of the irrigation projects, where proper methods are employed and which are for communal development under supervision.'^{viii}

The closure of the African furrows was duly effected, but also posed a moral obligation on the part of Alvord not to issue more water rights to European farmers upstream in the catchment. So when a European farmer on the Shinja tributary applied for a water right in 1948, the NC together with Alvord objected to the grant at the Water Court not only on account of the frequent water shortages experienced by the Nyanyadzi scheme, but also on account of 'justice'.^{ix} Nevertheless the Water Court granted a water right to the Shinja farmer.

The limited amount of government staff monitoring water abstractions on the ground, allowed both European farmers and African cultivators some room for manoeuvre to take water as and when required, particularly in areas that were not serviced by roads. Only on occasions that government officials strayed from the beaten tracks did such 'unauthorised use' of water come to light. Such was the case in 1948 when the irrigation manager for Nyanyadzi took a different road to district head quarters in Melsetter and stumbled across some irrigation furrows in Mhakwe and Biriwiri. The manager promptly called for a survey of all tributaries of the Nyanyadzi river so as to conserve river marshes and stream banks, the very degradation of which resulted in increased fluctuations in the river flow experienced at the Nyanyadzi project's intake.^x Other unauthorised irrigators concerned rent paying African tenants that resided on Crown land farms in the hills between Cashel and Melsetter. In 1949 the Cashel Farmer Association complained about these African tenants that grew wheat on their furrows, thus practising 'unfair competition'. Both the NC and PNC considered the

¹⁰ The requested investigation by an engineer of the Irrigation Department revealed that water was lost in several places where the river passed limestone deposits as well as along the Nyanyadzi project main canal. See hand-written notes on NAZ, S2814/3586b, Letter from secretary for Native Affairs to the Director of Irrigation, 6 March 1939.

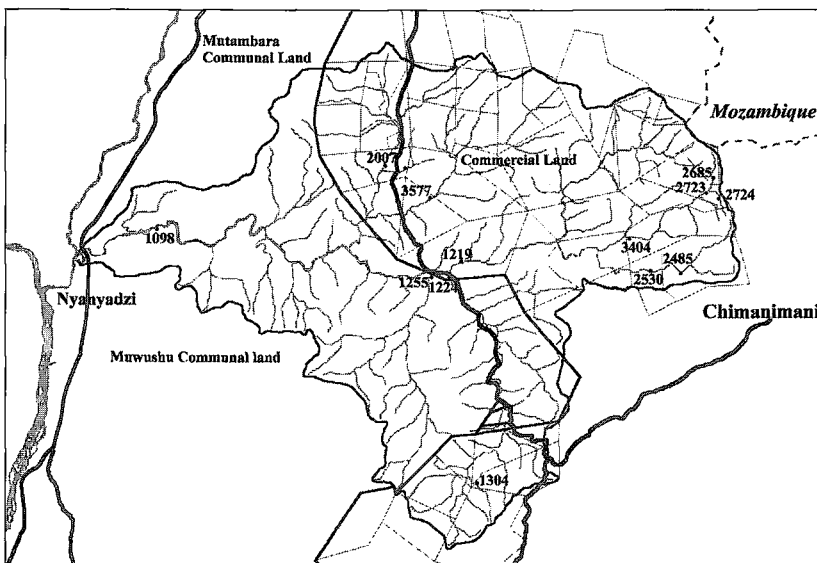
¹¹ The PNC slightly twisted the evidence by inferring to the Umvumvumu case. In the Umvumvumu river a hydrological investigation had brought to light that five upstream irrigation furrows operated by European farmers were unauthorised and wasteful, making predatory use of river water at the expense of the lawful African irrigation projects in Mutambara and Chakohwa. Rather than closing the unauthorised European furrows water right applications were solicited. NAZ, S160/GC/4, Letter from Director of Irrigation to Circle Engineer, Western Circle, 22 October 1947.

complaint unfounded, since there was a shortage of wheat in the country.^{xi} Furthermore the NC indicated he could not control the agricultural activities of these tenants, since it entailed 'travelling on foot and carriers are difficult to obtain these days.'^{xii}

After three consecutive drought years (1947-49), delaying the start of the planting season in the Nyanyadzi scheme, the PNC personally attended a Water Court hearing that decided on the grant of further water rights to European farms in the upper Nyanyadzi catchment. The PNC had objected as usual to the granting of the water right, since Nyanyadzi project would be negatively affected.^{xiii} By attending in person, the PNC found out about the special clause limiting the subservience of the priority of the scheme's water right. Alarmed by the prospect of further commitment of scarce Nyanyadzi river water, the PNC urged his superior, the CNC, to plea for removal of the clause. The clause increased the chances of future water scarcities affecting the scheme's ability to produce maize, and inhibiting future settlement of Africans removed from European farms.^{xiv} The Director of Native Agriculture made a passionate plea in 1951 to remove the clause, construct a dam on the Nyanyadzi river, and institute a hydrological investigation to establish its use and abuse.^{xv}

The hydrological investigation was undertaken in November 1951 and May 1952 by engineers of the hydrographic branch. The investigation provided the first actual assessment of water flows and irrigation as practised on the ground in the catchment. The team of engineers again discovered instances of unauthorised irrigation by Africans in Muwushu Reserve and deemed their continued operation detrimental to the winter flow available for the Nyanyadzi project.¹² The report also supported the removal of the special clause that limited Nyanyadzi's priority, since most of the irrigation potential on European farms in the upper catchment had been developed (see map 9.2 and table 9.1). To safeguard irrigation at the Nyanyadzi project the engineers suggested the construction of a dam on the Nyanyadzi river.^{xvi}

Map 9.2: Nyanyadzi catchment with water rights, 1952



¹² Other grounds for closure of such furrows were the absence of proper supervision by a European LDO.

Table 9.1: Nyanyadzi catchment water rights, 1952¹³

No. ¹⁴	priority date	property name	flow (l/s)	purpose	area ¹⁵ (ha)	crops	year constructed
1098	120137	Nyanyadzi scheme	283	wint & sum irr	400	maize, wheat, sunnhemp	1937
1219	110239	Nyanyadzi farm	5.7	wint & sum irr	8	maize, wheat	<1939
1224	110239	Nyanyadzi farm	5.7	wint & sum irr	8	maize, wheat	<1939
1255	200639	Nyanyadzi farm	2.8	wint & sum irr	4	maize, wheat	<1939
1304	120840	Erasmus farm	5.7	wint & sum irr	8	vegetables	1940
2007	221147	Moosgwe farm	15.6	wint & sum irr	22	maize, wheat	<1947
2485	191149	Nyashama farm	15	wint & sum irr	21.2	orchard, wheat, pasture	<1900
2530	141249	Sawerombi West farm	7.1	winter irr	10	wheat	<1900
2685	300350	Verlos farm	2.8	wint & sum irr	4	maize, wheat	1920s
2723	120450	Rietvlei farm	4.8	wint & sum irr	6.8	maize, wheat	<1900
2724	120450	Weltevreden farm	4.2	wint & sum irr	6	orchard, wheat	1896
3404	121151	Umchakata farm	3.4	wint & sum irr	4.8	maize, wheat	1930s
3577	190552	Shinja East farm	3.4	wint & sum irr	4.8	maize, wheat	1948
Totals 10 farms, 1 government scheme			359.2 l/s		513.5 ha, of which 113.5 ha on farms		

Source; DWD farm files and water right registry.

Dealing with an unreliable river: Nyanyadzi project's search for alternative sources of water

In the years after 1951 the management of Nyanyadzi scheme turned their eyes increasingly to the Odzi river as a source of water that could provide the water that was not supplied by the Nyanyadzi river. The first pump station was opened in 1957 and the water right from Odzi river was augmented in 1975 from 85 l/s to 498 l/s by using an existing allocation to the moribund Maranke irrigation scheme, which had a priority dating back to 1938.^{xvii} Yet, the pumps delivered only a fraction of the water right, suffering from limited capacity and frequent breakdowns (see 5.3).

In 1967 five automatic gauges were installed on Nyanyadzi river and its major tributaries, in anticipation of the construction of a major dam. However, as shown in chapter 5 the dam failed to materialise. Still the data generated by the automatic flow recorders did help in providing a better knowledge base on the river's behaviour. As Nyanyadzi scheme continued to suffer from occasional water shortages, the management resorted to acreage cutting measures.

After independence the monitoring capacity of the government agencies responsible for implementing the Water Act remained limited. During the mid-1990s the provincial office of the DWD had one river inspector on its pay-roll, responsible for monitoring water abstractions in the whole of Manicaland province. The NRB, responsible for monitoring stream bank cultivation, was better represented on the ground with one officer and an assistant officer in Chimanimani District. However, the political order of the day seriously impaired the effectiveness of their work.

¹³ Please note that this table only considers furrows for which a water right had been applied by 1952.

¹⁴ Most water rights cover more than one furrow, i.e. 2-4 abstraction points.

¹⁵ Here total command areas are noted. The actual irrigated command area in 1950 comprised 51.2 ha on the commercial farms and 287.2 ha in the Nyanyadzi project. In 1951 this area contracted due to drought to a mere 39.8 ha in the European farms and 282.8 ha in the Nyanyadzi scheme.

The impact of the official water-network on Nyanyadzi catchment

In conclusion it can be observed that the official network responsible for regulating and authorising water use at catchment level draws its strength from its legality, whilst only occasionally impinging on the reality on the ground. Rather than directing the abstraction of river water the Water Act at best follows the water use. The Nyanyadzi scheme was instrumental in creating some awareness about the official network regulating water. However, both European settlers and African furrow irrigators had acted, and continued to act, on a different understanding of legitimate water use, more in line with the riparian doctrine that had been officially abolished in 1913.

Initially very little was known about the behaviour of the Nyanyadzi river. Yet, the persistent scarcities experienced by the Nyanyadzi project were squarely blamed on illegal African furrow irrigators. These were considered wasteful users of a critical resource, reflecting the strength of the dominant narrative of the beneficial effects of government supervision. Both in 1938 and 1947 Alvord was possibly motivated to close their ventures on perverse grounds: the Water Court had just put a limit on the expansion of his Save irrigation network until the existing schemes were fully utilised. For the latter Alvord required as many plot holders as he could mobilise. The limited priority clause in the project's water right initially served to accord the upstream European farmers a fair share of the river's water, but was later used to expand European irrigation at the expense of African irrigation. In the end the official network was effective only in closing independent African irrigation furrows in Reserve land. However, in the less accessible upper reaches of the catchment African furrow irrigation persisted (see 9.5).

The actual monitoring and enforcement of the official network was tedious and *ad hoc*. Only when water shortages persisted was the river studied in more detail, and the upstream abstraction of water by European farmers accounted for. The span of the network widened through the growth of its administering agencies after the post-war influx of settlers into Rhodesia, and the installation of automatic gauges in anticipation of the Nyanyadzi dam. But the possibility for self-monitoring by actual water users, organised in river boards, was never realised in Nyanyadzi.¹⁶ Thus the actual monitoring of water use remained dependent on scarce government personnel. This implied that during the time the Water Act is needed most, i.e. during times when water is short, the official network offers no solutions, and it is left to other actors to mediate the distribution of scarce water.

9.3 THE FARMER FURROW NETWORK: ITS EMERGENCE AND ENDURANCE

Post-independence boom in farmer initiated irrigation furrows

Shortly before and after independence Nyanyadzi catchment witnessed an explosive 'boom' in the proliferation of indigenous irrigation furrows. A number of factors contributed to this. The freedom fighters had promised free access to land and water during their nightly rallies (*pungwes*). The intensive war activities in the district had resulted in a dramatic drop in the number of occupied European farms from 105 to 8 between 1976-78 (Alexander 1995, 180). The popularly elected ZANU steering committee issued temporary land permits to groups of smallholders interested in taking up farming on these vacated farms.¹⁷ Other Africans, like

¹⁶ In contrast, the NRB was considerably more successful in instituting self-monitoring by European farmers organised in Intensive Conservation Area committees in the 1960s. Through such participation European farmers could get government subsidies for the construction of dams and other water conservation measures.

¹⁷ To select prospective settlers two criteria were used: proven ability to take care of the land (through a master farmer certificate or the possession of draught power) and loyalty to ZANU(PF).

former *baas boys* (farm supervisor) did not wait for permission, but simply moved in. Most of them re-opened and re-laid existing irrigation furrows, others constructed new ones. Unhindered by any government administration insisting on the application of water rights, prohibition of stream bank cultivation or assessment of the suitability of the land for irrigation, the new settlers appropriated the well-watered landscape as and when it suited them. This led to a revival of wetland cultivation (*matoro*) and reclamation of ancestral land by traditional leaders that had been evicted from European farms in the colonial era. It was not until 1983 that a powerful state bureaucracy, capable of planning and controlling land and water development, was re-established in the district (Alexander 1995, 118). In 1984, most of the original 'squatters' were officially legalised as settlers in Shinja resettlement scheme.

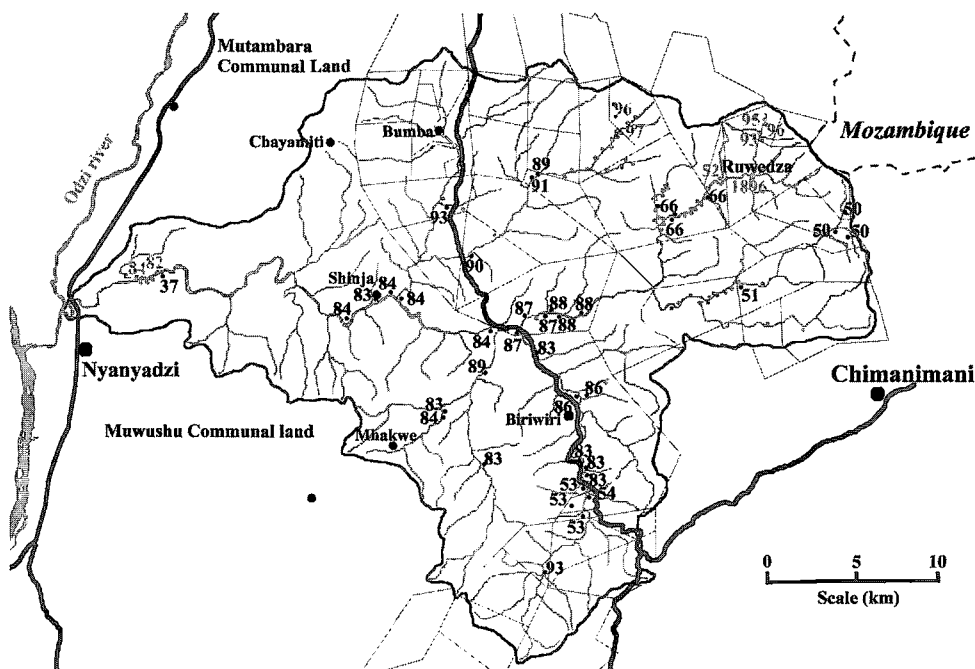
Other factors that contributed to the sustained growth of the number of irrigation furrows across the catchment were a series of droughts in the early 1980s and 1990s and the active support rendered to furrow irrigators by agricultural extension workers seeking to commercialise smallholder farming, for which access to water was essential (see Chapter 3). In Nyanyadzi catchment these developments resulted in the emergence of a network of more than 100 earthen irrigation furrows that mostly tap water from the river by means of temporary stone weirs (see map 9.3 and table 9.2). In addition numerous gardens along the riverbed are irrigated with help of buckets and light pumps (ram pumps), whilst land situated on the hill slopes is watered with the help garden sprinkler sets. The scale of these irrigation undertakings varies from 0.05 to 25 hectares, with one to twenty users drawing water from the same abstraction point. The distribution of irrigation furrows across the catchment is uneven, with a bias towards the upper reaches that were formerly occupied by European farmers. More than two thirds of the furrows are located in the well watered areas that fall within natural regions one and two, whereas a mere 8% can be found in the dry natural regions four and five. The total irrigated area hovers between a minimum of circa 50 hectares in dry years and a maximum of 250 hectares in wet years.

A great variety of crops is grown, the main crops being maize and cotton in summer; beans, tomatoes, peas, vegetables and wheat in winter; green mealies in the hot season; and fruit trees, sugarcane and various types of vegetables year-round. Irrigation intensities vary across the different agro-ecological zones. In the upper, wet regions, the furrows are mainly used during the winter and succeeding hot season. In the lower dry end of the river furrows may be used year round depending upon the availability of labour and water. The irrigated produce is used for home consumption and distribution among family members, whilst excess produce is marketed locally to non-irrigating cultivators, schools, and the green markets at Chimanimani town and other business centres.

A majority of furrow irrigators grows cash crops under contract for one of the horticultural companies operating from Mutare and Masvingo. Depending on market developments and assessment of water availability the dominant crop grown under contract may be tomatoes, beans or peas. In 1997 paprika became a popular crop because of the prices offered on the European export market. During drought years, like 1992 and 1995, no contracts may be offered. The contractor normally supplies seed and fertiliser and collects the produce at a price fixed at the start of the season. Not all furrow irrigators engage in this lucrative business that normally provides for cash to pay school fees and other capital outlays. Many of the irrigating 'squatter' communities on farms in the upper catchment, that are either used for cattle ranching by a European farmer or have been designated communal grazing areas for Shinja resettlement scheme, have no access to reliable roads. These communities use their furrows mainly to grow vegetables for sale to compounds of forestry workers and to grow

wheat for subsistence. Furrows are also used to replenish fishponds and to provide water for dip tanks, livestock and domestic uses.

Map 9.3: The farmer furrow network in Nyanyadzi catchment



Source: Farmer initiated irrigation furrow survey, 1996-97.

N.B. Black dots indicate furrows with water right (year of priority indicated); Grey dots indicate furrows without a water right (year of construction indicated)

Table 9.2: Some characteristics of the farmer furrow network in Nyanyadzi catchment

Type of land user	Furrows (no)	comm. area (ha)	irr. area (ha)	Water users (no)	water right (%)	measuring device (%)	Crop contract (%)
LSCF	2	25	2.5	1	0	0	0%
ELSCF	2	24	7.5	2	0	0	50%
SSCF	2	14	10	3	66%	50%	100%
Resettlement	>37	>47	>40	>70	<27%	<13%	75%
Communal	>21	>59	>35	>46	<67%	<14%	50%
Squatters	>36	>75	>50	>70	<11%	<11%	30%
Totals	>100	>244	>145	>192		<13%	

Source: Catchment wide survey of irrigation furrows, 1996-97; DWD water right register, March 1995.

Note: LSCF = Large Scale Commercial Farmer; ELSCF = Emergent Large Scale Commercial Farmer; SSCF = Small Scale Commercial Farmer.

Settlement, development and use of irrigation furrows in village 12

Village 12 was originally named Nyanyadzi farm. In its South-western corner Paradzai Chirongwe dug an irrigation furrow in the 1930s. The first European farmer who settled on Nyanyadzi farm allowed Paradzai continued use of the furrow in exchange for a contribution to the rent required to lease the farm from the government. When the farm changed hands to its last owner, Hugo Seebright, the Chirongwes were chased off the farm, except for Paradzai himself, who became the *baas boy* (farm supervisor). A number of other irrigation furrows were established on the farm. In 1979, Hugo Seebright emigrated to South Africa, selling the bricks and roof of his Cape Dutch mansion to Africans from neighbouring Mutambara Reserve. The farm was soon invaded by four separate groups, which extended claims on the land on different grounds.

Paradzai Chirongwe and his clan settled in the area between the Biriwiri and Mhakwe rivers and sub-divided the command area amongst its members (furrow 7 in table 9.3). Their claim on the furrow was informed by ancestral heritage and involvement in its original construction. Maintenance and water distribution activities are initiated by the clan eldest and organised along lines of seniority in clan membership. Disputes are resolved by kraalhead Chirongwe, who also allocates irrigated and rain-fed land to new members of the clan (young couples).

A second group was headed by headman Saurombe, who was not recognised as Chief by the Rhodesian administration in the 1960s, but nevertheless claimed the area South of the Nyanyadzi river as his home area. He invited others (squatters) to settle in the grazing area obstructing the VIDCOs project that seeks to establish fenced paddocks in the area. Saurombe practised *matoro* stream bank cultivation in the river. Later on he was included as head ender in furrow number 3.

Two other groups of settlers arrived in possession of official letters, which allowed them to settle on the farm in anticipation of the establishment of a resettlement scheme. Their letters had been issued by the district ZANU party committee, acting on behalf of the newly independent government. Marowa was the district treasurer arriving with nine fellow settlers. Straightaway Marowa appropriated two of the existing irrigation furrows. Some of his fellow settlers found the going tough on the thickly forested land and later abandoned the farm. Naison Chiambiro, a Methodist teacher, arrived leading another group of ten interested settlers, settling at the eastern end of the farm. Naison took out a new irrigation furrow on the right bank of the river (furrow no. 1, table 9.3). His fellow settlers soon left, disappointed by the fact that the government was not assisting them with land levelling, provision of draught power and other agricultural inputs. When the farm was officially resettled in 1983/84 a total of 42 stands and plots of one hectare each were issued to interested settlers by means of drawing tickets with plot numbers contained on them. Marowa got 'lucky', and drew plot number 1, which included the irrigated land and former Dutch Cape mansion of Hugo Seebright. Chiambiro was forced to pick one of the plots irrigated by his furrow, allowing three others to settle on the remaining plots within its irrigated command.

Initially Marowa shared his furrow (number 5) with two other official settlers, but after paying for the lining of the furrow and acquiring an official water right at the end of the 1980s, Marowa asked money from the downstream users. One refused and was denied water, whilst the other pays an annual fee in exchange for water. In addition Marowa has settled a cousin at the downstream end of his land. In contrast Chiambiro and his fellow settlers share the maintenance responsibilities and water in their canal proportionally. Over time more

furrows were taken out by official settlers, whilst the existing furrows were expanded, so that by the mid-1990s a total of seven furrows irrigated 23 hectares of land, occupied by 24 different settlers (map 9.4).

Map 9.4: Village 12 irrigation furrows and official settlers

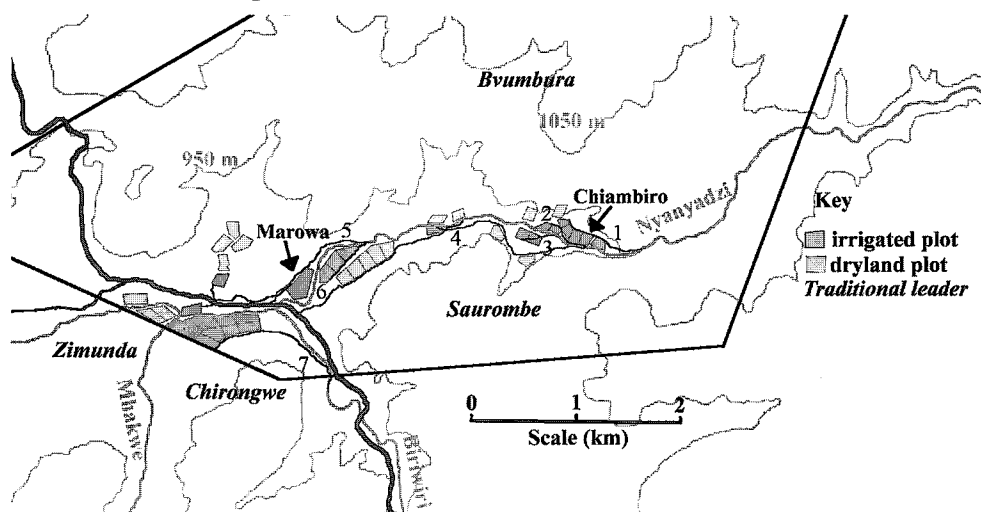


Table 9.3: Farmer furrows in village 12 and their characteristics

Furrow No.	river bank	command area (ha)	users no.	water right	date	meas. device	lining	contract
1	Nya r/b	4	5	final	1988	yes	yes	yes
2	Nya r/b	1.5	2	prov	1988	no	no	sometimes
3	Nya l/b	1.5	2	prov	1988	no	no	sometimes
4	Nya l/b	0.5	1	prov	1990	yes	rock	no
5	Nya r/b	4	4	final	1987	yes	yes	yes
6	Nya l/b	3	3	no	-	no	no	sometimes
7	Bir l/b	8.8	9	final	1988	yes	yes	yes
Total		23.3	26			4	3-4	3-6

Note: l/b = left bank; R/b = Right bank; Nya = Nyanyadzi river; Bir = Biriwiri river.

Key principles of furrow irrigation

Some of the principles that inform the water use practices of furrow irrigators provide a sharp contrast to those enshrined by the 1976 Water Act. A prime difference with the Water Act, which vests ownership and authority of use over surface water in the hands of the state, is that furrow irrigators perceive river water as an open access resource, i.e. river water belongs to God and can be abstracted by anyone using land in the vicinity of the river. Priority of use is not accorded on the basis of seniority, but on the basis of pre-emptive accessibility. However, there is an important caveat. No one may abstract the full flow of a river, since most people honour the human trait of 'giving chances' to fellow water users, whilst others stress the need to reserve water for 'living creatures in the river', preserving the ecological integrity of the river system. Thus rather than a prior appropriation doctrine, furrow irrigators embrace a riparian notion of water allocation.

During periods of low river flow, different ways of sharing and economising on the available water are practised, depending amongst other things on the way the furrow irrigators conceive their catchment. Normally only upstream users abstracting water from the same river (tributary) are perceived to be part of the problem. The top end boundary of the catchment can be variously defined by a natural obstacle (e.g. mountain ridge), land use classification boundary (e.g. from resettlement to freehold land), community boundary or the watershed. For instance village 12 irrigators do not consider themselves to be in competition with furrow irrigators located along the upper tributaries of the Nyanyadzi river (Ruwedza and Nyashoma) due to the steep, narrow gorge which separates their land from those upstream.

The preferred way of sharing the water is by devising a time-based water rotation schedule that distributes scarcity proportionally amongst the different users. Amongst users that share a furrow, this is a common practice. Amongst the users of different furrows such sharing is rare and seems to depend on the allegiance and following that down streamers can muster amongst up streamers (see 9.5 for an example). More common is the practice of bringing the water down to one's furrow by closing upstream furrow intakes (preferably at night) or asking upstream irrigators to revert the water back to the river. Various claims on the water may be invoked to negotiate for such temporary closure or diversion of the water back to the river. For instance, a member of a royal lineage may claim mastery over ancestral spirits providing a 'natural' right of access. Others may claim seniority in water use to gain preferential access. When asked, most furrow irrigators consider water scarcity management to be a task of the users themselves. None of them referred to the government or the Department of Water Development, which is the legally recognised moderator of water scarcities. At the individual furrow irrigator level, the preferred way of coping with water shortage is to limit the acreage under crops. Thus the irrigated command contracts during times of scarcity, whilst it expands in times of plenty.

Several material and hydraulic features of the irrigation furrows minimise the impact of water scarcity and the occurrence of conflicts over water (see below). In all cases, irrigated production is complemented by other practices of gaining a livelihood (e.g. rain-fed agriculture, irrigated gardens, livestock rearing, and non-agricultural activities such as circulatory labour migration, bee keeping and craft making).

9.4 A HISTORY OF UPSTREAM RAIDS: FAILED WATER SHARING ARRANGEMENTS

Upstream raids and failed water sharing arrangements

In March 1982 the Provincial Water Engineer responded to a report by the IMC on water shortages experienced in the scheme by pointing out that there should be more than 'ample water' in the Nyanyadzi river, and if there was not, the reason would be 'illegal water abstraction upstream of the irrigation canal take off'.^{xviii} During the dry summer season of 1983 half the maize and cotton crop in Nyanyadzi failed due to a shortage of water.^{xix} Irrigation manager Sithole put the blame on the 80 hectares of land irrigated illegally upstream. He convened a meeting with the IMC, NRB Agritex and Derude to discuss ways to curb such illegal water abstraction.^{xx} Yet, nothing happened.

The first upstream raid

During the subsequent dry summer season of 1984 another 68 hectares of the maize crop was lost due to water shortages in the Nyanyadzi river.^{xxi} For the winter season of 1984 the acreage under beans was cut to one acre for each plot holder, yet the irrigation intervals in the

scheme rose to 40 days or more.^{xxii} After making futile appeals to his superiors to stop the upstream water abstractions, Sithole decided to act himself. Accompanied by the maintenance gang and a member of the police, he went upstream along the Nyanyadzi river and destroyed 28 weirs that obstructed the river flow to Nyanyadzi. After a week most of the furrow irrigators had re-constructed their weirs, and the irrigation manager and his gang went up again. This time they were met by angry irrigators with bows and arrows, threatening to shoot them.^{xxiii} The furrow of Marowa, member of the district ZANU party branch (see chapter 3), was also closed:

'Before independence there was no problem whatsoever with these small furrows along the river. They were operated by whites. But then in 1984 the trouble started. These irrigators from Nyanyadzi came here to close my furrow. Agritex and the police were also there. They shouted all sorts of things at me, and they removed the wired fence I had constructed along my land. Afterwards I went to see the member in charge of Nyanyadzi police. He apologised to me. And then the District Administrator phoned them. And they apologised to him too.'^{xxiv}

The upstream furrow irrigators quickly mobilised their MP (Dube), who had promised them free access to water and land after the April 1980 elections. The DA was instructed to issue water rights to the irrigators, a fact which exasperated Sithole, who believed Nyanyadzi river water was 'earmarked' for use in the 'gazetted' scheme.

Subsequent raids and water sharing arrangement

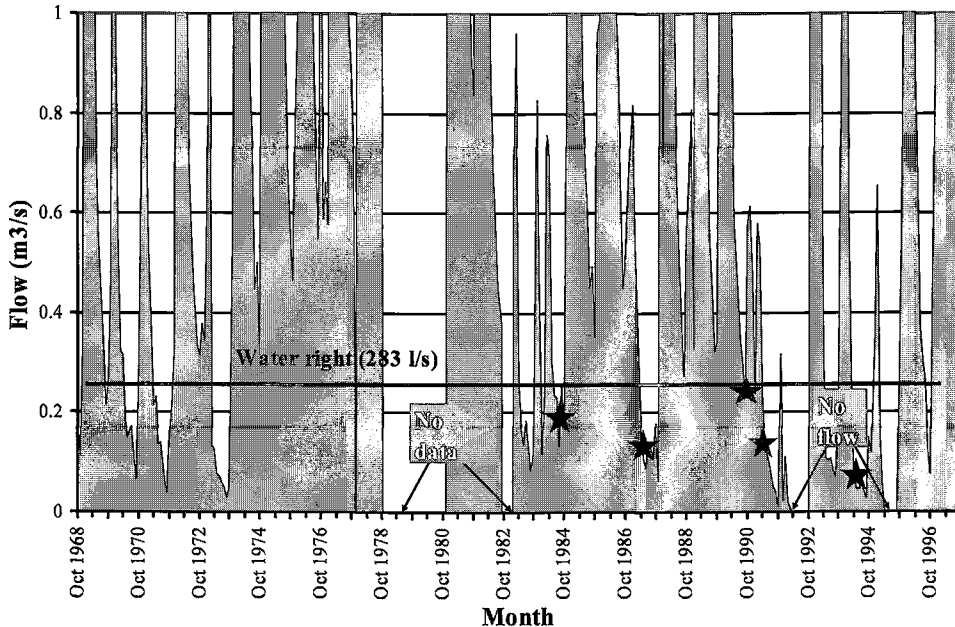
After a couple of wet years, the Nyanyadzi river supply dwindled again in May 1987, threatening to dry out the standing beans crop. Irrigation Manager Sithole this time built a strong alliance involving the IMC, the councillor, the NRB inspectorate and the member in charge of the Nyanyadzi Police. The District Administrator was tipped off on the nature of the impending action. On 11 May they went upstream with a truck full of general hands and destroyed all furrows abstracting water from the river. Many of the furrow irrigators were served with 'tickets' (fines) and some resistant irrigators were arrested. The net result of the raid was that 'little water came to the scheme, but not enough for irrigation'.

The backlash of the action was intense. Some of the well-connected furrow irrigators mobilised the DA, who in turn ordered the arrest of the irrigation manager, NRB inspector, and member in charge of Nyanyadzi Police station. They were made to write statements and held in custody for several days. Sithole refused to give a statement arguing that he was employed by government to do exactly what he had done: to bring the water to its rightful destination. The District Administrator offered to mediate in the conflict and proposed a water sharing arrangement between the upstream furrow irrigators and the scheme. Each group would take water for one week, leaving the water to the other group during the second week. Initially the Irrigation Manager turned the offer down, because he didn't want to share the water with 'thieves'. Later he was made to honour the agreement since those furrow irrigators that had been granted a water right held a legitimate claim. Yet, the deal was ineffective in delivering water to the scheme. Nobody was available to monitor its implementation, whilst the little water that was released by up streamers either evaporated or percolated in the dry riverbed before reaching the Nyanyadzi scheme intake.

As shown in graph 9.1 more upstream raids were organised in 1990, 1991, and 1994. The raids occurred whenever the Nyanyadzi river supply dropped below the scheme's flow right. In years that the river fell dry no upstream raid was organised, since the chance of success would be minimal. The DA brokered water sharing arrangements in 1990 and 1991, though the terms changed in favour of Nyanyadzi scheme (three weeks water versus one week for

the upstream furrows). Yet again the arrangement did not yield tangible improvements in water supply to the scheme.

Graph 9.1: Nyanyadzi river flow at hydro-station E119 and the occurrence of upstream raids (stars)



Contested nature of the raids

The raids show a difference in perception as to who is entitled to abstract water from Nyanyadzi river. Whilst the Irrigation Manager and block C plot holders argued their case on account of being the first legitimate users of the water, the upstream furrow irrigators and the extension workers assisting them contested the scheme's priority right for reasons of efficiency and productivity:

'Down at Nyanyadzi irrigation scheme they spill at lot of water through their unlined canal. On top of that the water will hardly reach their point. It can be better used here (...) We bring in money for the country. The yields attained here are higher than down there.'^{xv}

The furrow irrigators considered themselves as much stakeholders to the Nyanyadzi river as the official irrigation scheme. In their view anyone with land positioned along a public stream had a right to abstract water from it. The furrow irrigators were strengthened in their opinion by the mere fact that they had invested labour and money in the construction of their furrows, whereas block C plot holders enjoyed government assistance. Nyanyadzi plot holders and the Agritex management were inclined to argue the opposite: the scheme's plot holders paid fees for the water, whereas the furrow irrigators took the water for free.

One effect that was produced by the raids was that furrow irrigators started to apply for water rights. The spread of water rights is shown in map 9.3 and reflects the range of the various upstream raids that occurred. Extension workers operating in those areas affected by the raids eagerly assisted their favourite clients, the furrow irrigators, by processing water right

applications and installing the stipulated measuring devices. They disapproved the fact that their colleagues at Nyanyadzi were engaged in the destructive act of closing upstream furrows.

The extension worker for Shinja communal area, Mr Tembani, remembered how a 1991 field day on irrigated cotton was disrupted by a truck full of Nyanyadzi people. Initially he thought all his colleagues from the Agritex Nyanyadzi office had come to admire the wonders that could be achieved by a furrow irrigator. But soon it transpired that they had only come to check whether the furrow irrigators kept their part of the water sharing deal or else their furrows would be destroyed. Tembani was furious. He pointed out to his colleagues that it was not their business to police the river, since the NRB and DWD were responsible for that:

'What about in future when you will be transferred to work in this area. Are you going to face those farmers (furrow irrigators, AB)? Because they will recognise you. They know your face. How best are you going to operate then?'^{xxvi}

By the time of the May 1994 raid, described in 9.1, most furrow irrigators possessed either final or provisional water rights. Still their furrows were closed, for various reasons (see 9.1).

Intricacies of the May 1994 raid

The May 1994 raid took place in the wake of strained relationships between Agritex and the plot holders at Nyanyadzi. The summer maize crop had withered as a result of a decision of the Irrigation Officer to divert the maintenance gang from the Odzi pump station to the main canal. However, the Nyanyadzi river could not supply sufficient water to save the maize crop, which in turn created bitter resentment towards the Agritex office (see 6.2). When the Nyanyadzi river supply started dropping in April, the irrigation manager felt compelled to do something in favour of both his office's reputation and the water starved plot holders.

Instigated by block C plot holders, the only extension worker who had been part of previous upstream raids, informed the irrigation manager how to do it. Next the irrigation manager informed his superiors of his intentions and mobilised the necessary support from the NRB, the police, and two councillors. The reasons for the Nyanyadzi ward councillor to participate were obvious. The same cannot be said of councillor Matyashe for the upstream Shinja ward, since the action affected the furrows of farmers from his own area. Afterwards some denounced his participation.^{xxvii} It may well be that Aron Matyashe had ulterior motives. Through his support he wanted to win the favour of block C irrigators, who inhabit an area which falls within his authority as the unrecognised headman (see 8.1). Councillor *cum* headman Matyashe even went as far as promising the irrigation manager that he would do everything in his power to curb the irrigation furrows in his area, if he was given a plot in Nyanyadzi irrigation scheme.

Both extension workers that operated in the affected areas disapproved of the raid. They were disgruntled in particular by the destruction of the furrows of irrigators that had lined their furrows, paid for the installation of a measuring device, and had been granted final water rights. Neither the irrigators nor the extension workers had been aware of the need to install gauges as well. The extension worker for village 12 indicated he did not know how to calibrate a V notch or flume.¹⁸ Many furrow irrigators act on the understanding that as long

¹⁸ Calibration of a V notch is complicated. First of all one needs another measuring device to establish the flow. Next one has to vary the flow and empirically establish the correct discharge factor in the discharge formula. After that a scale has to be fixed on the v notch to relate the water level to the discharge flowing

as the water level does not exceed the extreme ends of the V of their V notch, they stay within the water allocation contained in their water right.¹⁹

Yet, as usual the furrow network prevailed over the Nyanyadzi scheme. The water supply to the scheme only improved for two days, after which the upstream furrows had been rebuilt. Marowa, furrow irrigator in village 12, phoned the DA after the raiders had left his farm to ask for permission to re-open his furrow on account of his water right. The DA duly allowed him to do so, promising Marowa to discuss the issue with Agritex. The irrigation manager for Nyanyadzi, responsible for organising the raid, claimed he had not been aware that some of the furrow irrigators whose furrows were closed actually had a right to the water:

'I wanted to show them why I was the manager at Nyanyadzi. Right. So I did close those furrows. So if they think I was wrong, but well then, let them do the right thing! What is Nyanyadzi going to do?' xxviii

When I confronted the former irrigation manager for Nyanyadzi, Sithole, with the ineffectiveness of the May 1994 raid, he responded that the irrigation manager should have gone up the river again and again. Since the DWD are absent and the NRB ineffective, the task of policing the river fell to the irrigation manager. In his view:

'You have got to raid the river constantly. You can't do it for two days only. One bad thing with it is that the District Administrator is behind the people.'

Conclusion: the limited span and ineffectiveness of the official water-network

The raids demonstrate the persistent failure of the official water-network to deliver during the time it is needed most (i.e. during water scarcities). The Water Act and the regulations contained in it is considered illegitimate by a majority of furrow irrigators. Each raid resulted in a surge in water right applications, clearly demonstrating the thin representation of the water administration on the ground and its propensity to follow water development rather than structure or regulate it. After 1985 the amount of committed water to right holders exceeded the base flow of the river during one out of every two years (Bolding *et. al* 1996, 210). Thus the Nyanyadzi river catchment became increasingly over committed, as is clearly reflected in the increased intensity of water shortages experienced at Nyanyadzi irrigation scheme. The geographical spread of water rights reflects the range of the raids and density of the road network. However, lacking an effective institution to monitor and enforce the Water Act, the spread of water rights across the catchment was of limited value to mediate water scarcities. The upstream raids did little to enforce the priority right of the Nyanyadzi scheme irrigators: the limited amount of available water dissipated in the dry riverbed before reaching the scheme's intake. The water sharing arrangement that was negotiated by the District Administrator between upstream furrow irrigators and the scheme's management failed to mediate the scheme's water woes for the same reason. Thus it was that the behaviour of Nyanyadzi river water proved obdurate: the water failed to act as prescribed by the Water Act.

through it. Once the gauge (scale) has been fixed, the upstream end of the v notch has to be kept clean, since even a minimum disturbance caused by some settled sediment is capable of distorting the readings.

¹⁹ I took some water discharge measurements with the help of a current meter in several furrows at village 12. Before undertaking the measurements I would ask the owners of the furrow to estimate the amount of water flowing through their furrow. This exercise yielded wild guesses, varying from 50 to 200 litres per second. The measured flow rates varied from 10 to 25 litres per second.

9.5 INTEGRATED WATER RESOURCE MANAGEMENT BEYOND THE STATE IN RUWEDZA

The final case study looks at the development and management of a network of farmer initiated irrigation furrows in one of the two upper arms of the Nyanyadzi river. The Ruwedza river originates in the mountains that form the border with Mozambique. The river is supplemented by a number of tributaries, streams and springs before it passes through a rocky gorge, that is impossible for humans to pass, and joins the Nyanyadzi river. Despite the well-watered nature of the area, the Ruwedza river and its tributary, the Muchero river, contribute little water to either the Nyanyadzi winter or summer flow. The valley can be reached from the East by means of a rudimentary road, tacking off from the Cashel-Chimanimani mountain road, or alternatively from the West by foot through a steep mountain path. Because of its inaccessibility little government attention has been directed at the valley and its inhabitants. Before delving into the network's water use characteristics an historical overview is given of its inhabitants and their limited encounters with government officials.

Afrikaner farmers and their irrigating tenants

The Ruwedza river forms the natural boundary separating Chief Mutambara and his area to the North from Chief Chikukwa's people in the South. Before the first European settlers arrived three African families inhabited the area. The father of Sixpence Matsekete, the present headman and *mudzibaba*²⁰ of Chief Chikukwa, stayed at the southern bank of the river at the inaccessible downstream end of what later became known as Camperdown farm. Sekuru Maigiri was born in 1900 in an area later known as Hendriksdal farm, whilst Herbert Munyebvu stayed along the northern tributary of the Ruwedza river, in an area known as Muchero. Munyebvu later became a kraalhead for Chief Mutambara. The three clans used the fertile, well-watered strips of flat land close to the riverbed to grow a variety of crops, such as sorghum, millet, maize, beans and sugarcane.

On a rainy day in December 1895, Hendrik Steyn's farm wagon got stuck in the muddy flats of the Ruwedza river. Weary and exhausted Hendrik and his family decided they had found their promised land, and settled at the farm which was named Hendriksdal (Hendrik's valley). He and his family were part of the Henry-Steyn trek, one of the last groups of Afrikaner settlers to arrive in Melssetter district. Its members were all part of the Steyn clan, that carved out extensive farms for themselves in the area between present day Chimanimani and Cashel. One of the first things Hendrik did was to make the Maigiri family aware of their new status as labourers by forcing them to dig a furrow to bring water to his mud and pole homestead and garden. In exchange for providing free labour during one week every month, Hendrik allowed the Maigiris to stay on 'his' land. In a similar vein Pieter Steyn, who had settled with his family at the neighbouring Pietershoek (Pete's corner) farm, requisitioned the services of the Munyebvus and Matseketes, who were allowed to stay where they were, at Camperdown farm.²¹

²⁰ The *madzibaba* ('the fathers') are responsible for selecting and crowning a new Chief in case the office bearer has deceased. Maungwe Matsekete, the father of Sixpence, acquired this status during the days of the Shoshangaan state. Chief Chikukwa and most of his people fled the invading Shoshangaan and settled in Bocha, across the Odzi river. Maungwe, however, remained behind to fight the Gaza state *impis* (soldiers). When Ngungunyana left for his southern capital in present-day Mozambique, Maungwe Matsekete went to Bocha to bring Chief Chikukwa and his people back to their land. Ever since the Matseketes are known as the fathers who protected the land on behalf of the Chief.

²¹ None of the Steyn settlers was interested in occupying Camperdown farm, possibly because of its inaccessibility.

Sekuru Maigiri commented that the arrival of these new landlords did not cause a lot of changes in their daily lives, besides the compulsory labour that was exacted from them. The settler farmers did not differ much in general outlook and livelihood practices, apart from the colour of their skin. The Steyns stayed in the same type of homesteads, cultivated the same crops, were mostly illiterate, lived as extended families and relied in the main on members of their clan to help each other out. Like their African labourers, the Steyns were Christians and buried their deceased on the farm. The only changes that the Afrikaner settlers introduced were irrigation, wheat, and plough cultivation, which was of limited value in Ruwedza with its steep hillsides.^{xxix} The first two innovations were eagerly copied by the father of the present headman Matsekete, who opened his own irrigation furrow as early as 1919, after the example set by the Methodist missionaries at Old Umtali mission where he had trained as a priest. Over time, more furrows were opened up by sons of the headman and two other African families who worked on neighbouring farms. In 1934, four furrows were tapping water from the lower end of the Ruwedza river. By then George Steyn of Pietershoek farm leased Camperdown farm from the government to ranch his cattle. George allowed his African labour force to practise irrigation on the farm in exchange for a contribution towards the rent he had to pay the government (the four families paid three shillings each per annum).^{xxx}

Government interference, 1966-77

Probably due to the inaccessibility of the valley, no mention was made of the Ruwedza irrigation furrows in the 1952 hydrological investigation. However, sometime during the mid-1960s a government officer must have taken note of the irrigation practised in the valley. In 1966, the owners of Hendriksdal and Goeie Hoop farms applied for provisional water rights and George Steyn did the same for the four irrigation furrows of his tenant labourers at Camperdown farm. This marked the start of a long administrative process which lasted for ten years and involved 21 different communications (see Bolding *et al.* 1999, 203). After a Conex officer had noted that the heavy seepage from the existing furrows actually served a purpose in the sense that reeds and riverine shrubs benefited from the seepage water, the irrigating tenants were absolved of the obligation to line their furrows. Still the Water Court insisted on the provision of measuring devices for each of the four furrows contained in the water right. These were only installed in 1975 (V-notches) with help of George Steyn. In March 1976 a final water right of 0.10 cusecs (2.8 l/s) was granted.

The De Bruin's²² of Goeie Hoop and Hendriksdal farms were less successful in securing a final grant. The two irrigation furrows at Hendriksdal and one furrow at Goeie Hoop got provisional water rights to irrigate 20 and 7 hectares of fruit trees respectively, but lacking measuring devices and properly lined sections these provisional grants lapsed in 1977 and 1973 respectively.

Independence war

During the war the valley provided one of the major routes for various groups of guerrilla fighters penetrating Zimbabwe from their training camps across the border in Mozambique. The guerrillas were offered food and shelter by the African tenant labour force on the European farms clustering the mountainous border area. An arms cache was established at the homestead of headman Matsekete. One of Sixpence's sons joined ZANLA and was later killed in action; his other sons were still young and acted as *mujibas*.^{xxxi} After one particularly

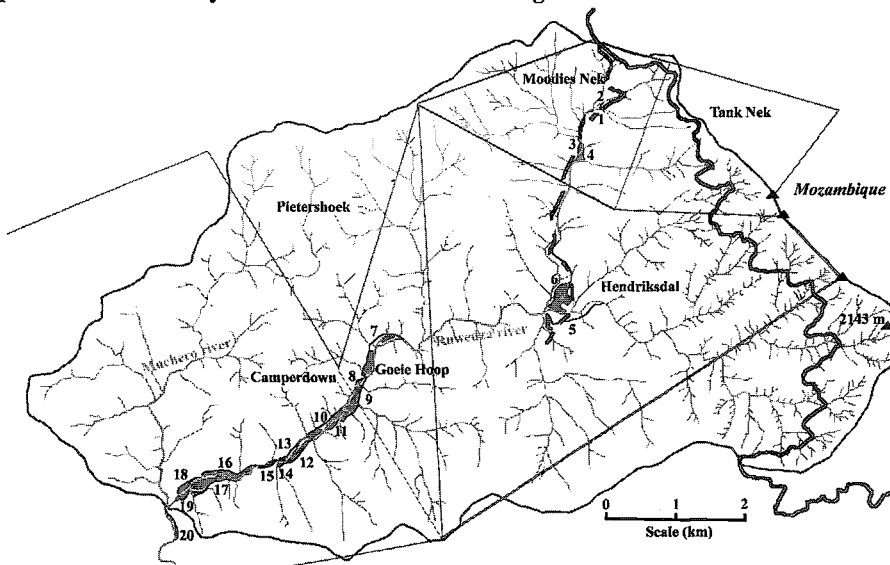
²² A daughter (Harmie) of the original farm owner Hendrik Steyn had married a member of the De Bruin family, who had bought both Goeie Hoop and Hendriksdal farms after the death of Hendrik in 1932.

despised Afrikaner farmer²³ had been killed by the guerrillas at his farm, most members of the Steyn dynasty, realising how vulnerable they were for attack, left the area. At Pietershoek farm, owned by George Steyn, a 'keep' (protected village) was established for the remaining farm labourers.²⁴ Most European farmers either sold up or left their farm and livestock in the care of the son of the murdered farmer. Thus many of the farms in Melsetter and Cashel Intensive Conservation Area ended up in the hands of Heyns, who turned them into cattle ranches under the care of former *baasboys*.

After independence

After independence the number of inhabitants in the valley rapidly increased and so did the number of irrigation furrows (see map 9.5). Ruwedza valley was one of the first 'liberated zones' in the dying stages of the war. The area was administered by a ZANU party committee that was headed by the brother to headman Matsekete, who later became councillor for Chikukwa communal area. Below, the development and land-use status of each farm in Ruwedza valley is presented.

Map 9.5: Ruwedza valley with farms and numbered irrigated command areas



Moodies Nek

The upper farm, known as Moodies Nek, was initially used for cattle ranching by Heyns, but was resettled in 1987 after Agritex had developed a land use plan. The settlement became known as Chihambiro village and was added to the existing Shinja resettlement scheme. In total eleven families were re-settled, that had been expelled from the over-crowded co-operative settlement scheme at Nyahode. Each family got 2.5 hectares of arable land, whilst the remainder of the farm was designated communal grazing area. Because of their remoteness from the rest of the resettlement scheme the Chihambiro settlers did not benefit from any agricultural extension services, and after the discontinuation of the bus service between Cashel and Chimanmani, were left to their own devices. The first settler opened up two irrigation furrows in the early 1990s, which after some dispute had to be shared with two

²³ Mr Heyns, who was nicknamed *masorry* for making his labourers feel sorry with help of his *sjambok*.

²⁴ George Steyn left his farm in 1979 and emigrated to South Africa.

female settlers (furrow no.3 & 4, see table 9.4).^{xxxii} Another family has used a powerful spring to irrigate some five acres (2 ha) of arable land by means of a moveable sprinkler set and hundreds of meters of hose (furrow no.1). They share their scheme with two related settler families, who contributed to the costs. Finally a widow took out a small furrow during the drought year of 1995 (furrow no.2, see Photo 17).^{xxxiii}

Table 9.4: The upper Ruwedza furrows and their characteristics

Furrow No.	source	# acres	# users	Year Constr-ucted	water right (y/n)	contract (y/n)	# leased acres
1	spring	5	3	1996	n	y	-
2	l/b	0.5	1	1995	n	y	-
3	r/b	2.5	2	1993	n	n	-
4	l/b	1.5	1	1990	n	y	-
5	l/b trib	5	1	1920	n (prov 66-77)	n	-
6	l/b	0	1	1896	n (prov 66-77)	n	-
7	r/b	18	1	1952	n (prov 66-73)	y	-
8	r/b	0.5	1	1992	n	n	-
Totals		33	11			50%	0%

Source: farmer furrow survey, June-July 1997. Note: (y/n) = yes or no; prov = provisional.

Thus seven of the eleven settlers enjoy access to irrigation, which they use to supplement their rain-fed production. None of the users had applied for a water right. All thought water belonged to God and could be used by any person who had land close to the river. All used their irrigated acres for the production of wheat and vegetables during the late winter season. In addition peas were grown under contract for the Cairns company in Mutare. Cairns provided free seed and transport. The Chihambiro pea producers were included in the contract sealed by producers in lower Ruwedza valley.

Hendriksdal

Initial plans on the part of government to include Hendriksdal farm in Shinja resettlement scheme were aborted after the Agritex district officer had declared the farm unsuitable for resettlement.²⁵ Thus the farm remained in ownership of the De Bruin brothers, who sub-leased the farm to Heyns. Heyns appointed two labourers from Ruwedza to ranch his cattle herd. Sensing the impending government squeeze on white farms, Heyns terminated the lease agreement by the end of 1995.²⁶ During the centenary celebrations of the Steyn-De Bruin clan held at the farm on 23 December 1995, Piet de Bruin and his wife decided it was time to go back to their roots.

Piet was a 4th generation descendant from the original settler, and was a jack of all trades during his labour career. Once back on the farm in early 1996 he planned to take up irrigated production and re-opened one of the old furrows on the farm (furrows no. 5 & 6).^{xxxiv} However, half of his vegetables froze during the first winter season, whilst he found no market outlet for the other half. Asked about his water right, he assumed the Water Act had been suspended. Piet and Inge de Bruin employed two labourers from Ruwedza to look after their three donkeys and three cows. During their second year at the farm, Piet went to work as

²⁵ Cite declaration of no interest of DAEO Shariwa from Agritex files.

²⁶ Heyns owned some twenty farms in Chimanmani and Rusape district. He sold six farms in the upper Nyanyadzi catchment that had remained in his ownership to Border Timbers in 1996 (see Van der Zaag *et al.* 2001).

a mechanic at Charleswood estate (at some 20 kilometres distance), whilst Inge ran a small, but unsuccessful tuck shop along the Cashel mountain road.^{xxxv} The farm was not a success. Piet complained about the unit tax he had to pay to council as well as the money he spent on maintaining the road to his farm.

Goeie Hoop

In 1982 Mrs de Bruin sold Goeie Hoop farm to *sekuru* Maigiri for the price of four cows. Maigiri's son, Munhundiripo used the proceeds from the pension he had acquired after twenty years of work as farm supervisor at Lord Plunket's farm near Chimanimani. During the period after 1982 the Maigiris expanded the area under irrigation at their farm (furrow no. 7), growing peas under contract, whilst selling excess maize and wheat to the GMB by means of a hired lorry. Munhundiripo, his two wives, and his old father run the farm, 40 cattle and the seven irrigated hectares by the original furrow as an extended family enterprise. They hired the services of two resident workers and their families, who in turn got access to irrigated land serviced by two other irrigation furrows at the farm (furrows no. 8 & 9). The Maigiris also ran a tuck shop at their farm offering basic commodities (soap, biscuits) to their workers and the Ruwedza community. When asked about his right to use water from the Ruwedza river, *sekuru* Maigiri explained the water belonged to God. The old furrow had been dug by himself with a string level in 1952. In his eyes, the right to abstract water from the river was inherently tied to the title deed of the farm, as had been the case with the European farmers before.

Camperdown

Officially Camperdown farm had been part of Shinja resettlement scheme since 1984. The area was known as village 14 and had a village development committee (VIDCO) which was chaired by both kraalhead Munyebvu and Atwell Matsekete, a son of the headman. After a conflict between the Munyebvu and Matsekete clans, the VIDCO was split in two. One was headed by Atwell Matsekete²⁷ and administered the area known as Ruwedza, whilst Munyebvu headed the committee that administered the northern Muchero and Marembwe areas resorting under Chief Mutambara. On three separate occasions in 1984, 1987 and 1994 Agritex extension workers came to peg stands at the farm. In the land use plan for the whole farm there would be room for nine families. However, the land use plans thus developed were never implemented.

According to a local narrative, straightaway in 1984 headman Matsekete, kraalhead Munyebvu and the heirs of the De Bruins teamed up to pay a visit to the Provincial Administrator. They wanted to be excluded from the resettlement scheme, preferring to stay in a communal area. The delegation used the support to the passing guerrillas during the war in their favour. After extending their stay in Harare with two weeks they returned with the news that they would be left in peace by the government. However, the resettlement officer for Shinja scheme, Butsu, was bent on including Camperdown farm as village 14. A common story in Ruwedza has it that Butsu only gave up after two baboons visited his home:

'When the baboons entered Butsu's home the dogs fled in fear. The baboons seated themselves on a sofa and told Butsu: "We need to stay in this area (Ruwedza, AB). We don't want resettlement." Afterwards Butsu developed a leg problem.'

²⁷ In a fashion typical of leaders in communal areas, Atwell performed a number of leadership roles. Besides being a son of the headman and VIDCO chairman, Atwell also acted as a constable of Cashel Police station and aide to Chief Chikukwa's court.

Ever since, Ruwedza people have cautiously guarded their independence and remained suspicious of outsiders and government officials in particular.²⁸ This is partly reflected in the unique practice of putting up signposts on farmland, bearing the name of the owner (see Photo 16).²⁹ Another sign of the independence of the Ruwedza inhabitants is the community school, which they initiated in 1984 and was officially recognised soon after. The area gradually filled up with new inhabitants. By 1997 some 140 families inhabited the former Camperdown farm. Of this number 41 stayed in Ruwedza valley, whilst the other 99 families dwelled in either Muchero or Marembwe.³⁰ An aspiring inhabitant first has to pay some money to either headman Matsekete or kraalhead Munyebvu before being allocated a stand. Most people in Ruwedza consider themselves part of Chikukwa communal area administered by chief Chikukwa and councillor Matsekete.³¹

The 41 *misha* (homesteads) of Ruwedza valley engaged in a variety of agricultural and non-agricultural exploits to make a living. All families cultivated rain-fed land, located on the steep hillsides of the valley often consisting of narrow terraces supported by stone benches. Twenty one of the households (51%) had access to irrigated land commanded by one of the twelve furrows that line the river (see map 9.6 and table 9.5). In addition most households (70%) had access to irrigated gardens, watered by springs that emerge from the fissured rock formations lining the valley. Many men, both fathers and sons, had temporary jobs with one of the many sawmills of Border Timbers in Chimanimani, at walking distance from Ruwedza. They only returned home for the weekend. The headman prohibited river bed cultivation (*matoro*), fining any person engaged in it.

Maize intercropped with beans is the main summer crop both on rain-fed and irrigated land. The irrigation furrows are normally only opened for use during the winter season to grow vegetables, beans and peas (cash crops), wheat and green mealies. In addition a great variety of crops is grown on different types of land.³² The mobilisation of labour and control over crop choice and proceeds is gendered differently across seasons, type of land and source of water that is mobilised. Women claim spring irrigated gardens as their exclusive domain, whilst their access to furrow irrigated land is limited to small portions during the winter season, except for widows who operate their own furrow irrigated land. Crops grown under contract provide the main source of cash income and normally fall under the control of men.³³

Most of the original furrow irrigators grew beans and peas under contract for a Mutare based company during the 1980s. However, dwindling water supplies since 1992 and an absolute water scarcity in 1995 precluded the signing of such contracts between 1992 and 1995. In 1996 the VIDCO secretary, Atwell Matsekete, managed to entice Cairns to give him, his

²⁸ When I first visited the area, hiking with a tent, I was received only reluctantly after frantic mediation by my research assistant, whose aunt happened to be married to one of the Matseketes. Contrary to other villages in Nyanyadzi river catchment my occasional returns and probing questions continued to be regarded with suspicion.

²⁹ I only came across such signs in small scale commercial farming areas, where owners hold title deeds to their farm.

³⁰ Marembwe is an area named after a local tributary stream to the Shinja river, itself a northern tributary to the Nyanyadzi river.

³¹ This Matsekete is a son to the headman.

³² The crops grown include sugarcane, *madumbe* (yams), bananas, and many different types of vegetables (okra, (sweet) potatoes, cabbage, cauliflower, carrots, leeks, pumpkins) in both gardens and irrigated commands, as well as different varieties of maize (including open pollinated varieties) and four different types of beans in rain-fed and irrigated land.

³³ The intricacies of the gendered control over labour and crop proceeds are beyond the scope of this thesis. For a brief overview see Bolding and Nyagwande (1998).

father, his uncle and the Maigiris seed for growing peas. They reaped sufficient peas to fill three 10 ton trucks, cashing Z\$25,500 in total (some US\$500 per person). During the winter season of 1997 nine pea producers were included in the contract, covering 10.6 hectares in six furrows. Also included in the contract were Maigiri and five other irrigators in the upstream settlement at Chihambiro.^{xxxvi}

Map 9.6: Farmer initiated irrigation furrows along the Ruwedza river at Camperdown

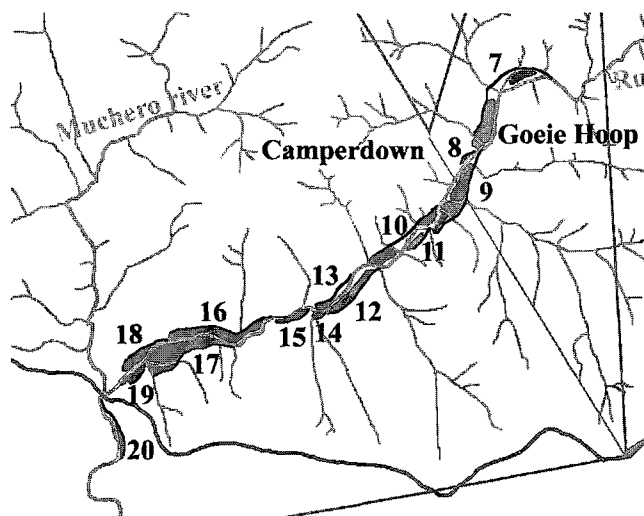


Table 9.5: The Camperdown furrows and their characteristics

Furrow No.	source	# acres	# users	Year Constr	water right (y/n)	contract (y/n)	# leased acres	Renter
9	l/b	13	3	1934	y (66)	y	-	
10	r/b	5	2	<1983	n	n	-	
11	l/b	0.5	1	?	n	n	-	
12	l/b	4.5	2	<1980	n	y	-	
13	r/b	0.75	1	<1981	n	n	-	
14	l/b	0.5	2	1932	n	n	-	
15	l/b	2	1	1984	n	n	-	
16	r/b	13	3	1919	y (66)	y	3	son of headman
17	l/b	9.5	3	1934	y (66)	y	3.5	son of headman
18	r/b	4.5	1	<1975	n	y	2	kraalhead Munyebvu
19	l/b	1.5	1	1992	n	y	-	
20	l/b	1	1	1992	n	n	-	
Totals		60.25	21				8.5	

Source: farmer furrow survey, June-July 1997.

The African irrigation paradigm at work: principles of water management

The operating principles of water capture and management in Ruwedza contrast with those enshrined in the Water Act, whilst broad similarities can be observed with the indigenous irrigation paradigm outlined in chapter 7.1. Water management as practised in Ruwedza valley embraces some of the principles of integrated water resource management that are celebrated in international policy circles.

Equitable capturing and sharing of the available water: agro-physical dimensions of the network

A basic principle of furrow irrigation is the equitable sharing of the available water over as many users and irrigable commands as possible. All furrow irrigators in Ruwedza claimed that water belonged to God and that everyone with land situated along the river had a right to use it. This principle is reflected in the spatial, material, and agricultural features of the network.

Map 9.5 shows the spatial set-up of the irrigation furrows that emerged over time in the valley bottom. The spatial and material dimensions of the furrow network produce a number of effects that help to maximise water capture and mediate the effects of water scarcity, whilst in general helping to maintain the ecological integrity of the river as well as ensuring everyone a fair share. By spreading the position of the furrow intakes maximum use is made of the flows of both the Ruwedza river and its many contributing streams and tributaries. The stone weirs are temporary structures that are washed away by flash floods, which prevents the destruction or siltation of furrows, whilst their permeability helps to distribute the water along the river. The open and permeable nature of earthen furrows helps to capture the in-flow of spring water, whilst the high percolation rates produce a continuous return flow that feeds riverine vegetation as well as downstream furrows.

Another agro-ecological feature that moderates competition over water amongst upstream and downstream irrigators is the difference in altitude, which in turn produces minute differences in the microclimate. One of the main inhibitions to irrigated agriculture in the valley is the occurrence of frost until late in the winter season. To minimise the risk of crop loss due to frost furrow irrigators carefully time the start of irrigation operations, delaying until mid or end July, depending on the severity of the winter. Downstream irrigators start earlier than upstream irrigators due to the difference in altitude and microclimate. The resulting staggered planting of the winter crop across the valley helps to mediate the peak water demand (during the planting and flowering stages of the crop) in time and space (*cf* Ambler 1991).

The geographical flexibility of locating furrow intakes helps to mediate conflicts and increase access to irrigable land. Initially the two royal clans shared land commanded by the tail end furrow in Ruwedza. However, after a conflict, which resulted in the emergence of two VIDCOs, the irrigable command was also split. This was done by making a separate furrow intake and weir at the bottom end of the original furrow. Such flexibility in shifting furrow intakes also occurred in a different form at the top end furrow of Camperdown farm. Kenneth Matsekete, brother to the present headman, had originally constructed this furrow (number 9 in table 9.5). However, after an intense river flood had washed away both the intake and upper end of the furrow, Kenneth was forced to construct another intake upstream on land commanded by Goeie Hoop farm. Kenneth was allowed to do so by the Maigiris in exchange for the inclusion of the farm labourer and the second wife of the farm owner in the irrigated command of the reconstituted furrow.

Furrow membership, maintenance and use

The different furrows in Ruwedza are often referred to by mentioning the name of the originator of the furrow, who often happens to be the biggest landowner as well. Membership in furrows is defined by past (labour) investments in its construction or kin-relationship to original plot owners. A plot may be inherited and sub-divided amongst married sons of the original plot holder, though initially, during the early 1980s, married sons would open up

furrows of their own. The steady influx of newcomers combined with the establishment of new families related to the original inhabitants in the valley has led to the gradual occupation of all irrigable land in the valley bottom. Combined with the lucrative business of contract cropping after independence, increased pressures on irrigated land have emerged. This has given rise to the new phenomenon of plot leasing after 1995 (see table 9.5).

Maintenance activities undertaken in the furrows consist of an annual cleaning and general repair at the start of the winter irrigation season and occasional emergency repairs after calamities (e.g. floods causing furrow blockages or destroying the intake). The annual cleaning is normally initiated by the tail end user of the furrow and comprises a couple of days work, whereby each user contributes labour proportionate to plot size and furrow segment. In the older furrows, used by members of the royal Matsekete and Munyebvu clans, communal work parties (*nhimbe*) are organised. Each member of the furrow contributes a chicken and sweet beer, whilst the work is done as a group.³⁴

Water is distributed proportionally amongst different members of a furrow by means of time-based water rotation schedules. During the night, the furrows are either closed, or the water is allowed to flow back to the river by means of a drain at the bottom end of the furrow. Furrow water is used for multiple purposes such as washing, livestock watering and brick making.

Conflict and water scarcity management

Ruwedza furrow irrigators share a common perception of their catchment that takes the watershed as its defining feature. Yet, the catchment is perceived to end at the bottom of the valley, where the river enters a steep, narrow gorge. Despite the existence of kin relationships with some of the downstream furrow irrigators along the Nyanyadzi river, users downstream of the gorge are not considered to hold a legitimate claim over Ruwedza river water.

Despite the fact that the original four tenant irrigators had been granted a final water right that provided them with a priority over upstream water users during scarcity periods, the Ruwedza furrow irrigators have not interfered with upstream water abstractions until relatively recently. The reasons cited for such abstinence were various. All embraced a riparian notion of water rights, which honours the practical principle of 'giving everybody a chance'. Some further claimed that users with a title deed to their farm have a natural right to the water as well. Others pointed at the amicable nature of their relationship with the Steyn-de Bruin clan, which had been sustained over four succeeding generations, weathering many storms. Again others pointed at the importance of preventing conflict with upstream users, including those in Chihambiro, since they all shared a common interest in maintaining the rudimentary road. Conflicts over water could impair the successful maintenance of the road, which was considered essential for the sustained production of peas under contract.

Initially the response of the four tenant families to water scarcities in the Ruwedza river was to limit the acreage under crops and to share whatever water was left by the de Bruins equitably amongst themselves by means of a time-based water rotation.³⁵ The traditional authority of both headman Matsekete and kraalhead Munyebvu, sharing the tail end furrow,

³⁴ *Nimbe* work parties are also organised for other labour intensive activities, such as sowing, weeding and harvesting. Whereas such forms of labour pooling and exchange were widely practised before the onset of settler rule, they have become increasingly rare in Zimbabwe's communal areas. In this case, the instigation of *nimbe* work parties is closely linked to the reproduction of traditional authority.

³⁵ The v notches that had been installed on their furrows played no role during water scarcity periods. None of the furrow irrigators had a clue as to which purpose these measuring devices served.

was instrumental in the institution and enforcement of the rota of water turns. The same authority was used to prevent the cultivation and destruction of the riverbed. In case a conflict arose, the case was heard at the headman's court or alternatively at the Chief's court. However, during the early 1990s this system of natural resource management came under strain due to a number of concurrent processes.

Firstly, the cumulative effect of a series of droughts during the late 1980s and early 1990s led to extreme forms of water scarcity, not experienced before in Ruwedza. Secondly, the ongoing influx and settlement of people in the Ruwedza valley led to a situation where all irrigable areas were used, greatly increasing the water demand. Thirdly, the conflict between Matsekete and Munyebvu precluded the institution and enforcement of measures to limit the water demand and share the available supply. Headman Matsekete could no longer claim authority over newly settled families at the northern end of the river. During the water short season of 1992 cuts in the irrigated command area helped little, since the water was so short that the instituted water rota could not honour the required demand. In 1995 the Ruwedza river dried out completely putting a preliminary end to the irrigation season.

In 1995, headman Matsekete went upstream to wrest water from the Chihambiro furrow irrigators claiming seniority of use and using the v-notch as proof of that. Gradually a tug-of-war ensued whereby individual furrow irrigators went upstream during the night to make holes in the weirs of upstream irrigators. Others reverted to night irrigation.

In June 1997, when the water situation was again precarious but not desperate, Atwell Matsekete assumed the role of his father, crafting a new alliance amongst the furrow irrigators included in the pea-growing contract. Invoking his authority as police constable and son of the headman, he tried to regulate water abstractions of furrow irrigators along the whole of the Ruwedza river by putting small wooden pickets at their intakes. The picket served as a gauge, with the maximum permissible water level painted on it. The measure was not very effective and Atwell soon reverted to the time tested system of water rotation schedules.

Conclusion

The principles and practices of water management in Ruwedza valley come close to the professed ideals of integrated land and water management that are presently condoned by the newly emerged international water discourse. The various social, material, and agro-ecological characteristics of the furrow network honour the capricious behaviour of water. Yet the network is limited in terms of its span and prone to collapse when confronted with extreme water shortages or when the traditional authority of the headman became subject to contestation by new settlers. Whilst the network achieves a semblance of equity amongst its members, access to irrigated land is mediated by the two powerful royal clans that initially resided on the farm. The on-going influx of new settlers and increased pressures on both land and water has led to a strong socio-economic differentiation between original, royal lineages and late comers.

9.6 CONCLUSION AND DISCUSSION: CONTRASTING NETWORKS AND MISSING LINKS

The contrasts of the two competing water-networks in Nyanyadzi catchment are presented by highlighting the principles that inform their mode of ordering; their ways of dealing with calamities (scarcity and floods); the potential and conditions for collective action; as well as the outcomes produced in terms of productivity, sustainability and equity. Finally, a brief

reflection is presented on the potential impact of the 1998 water reforms on the existing situation in Nyanyadzi catchment.

Founding principles of the two paradigms: contrasting modes of ordering

The official water-network and the furrow network draw on different principles that inform their modes of ordering. The principles are reflected in the way water is captured, allocated, and distributed.

State mediated prior appropriation versus user based riparian doctrines

A first and fundamental difference concerns the issue of ownership: who can claim and allocate public water? Initially this was a matter of individual water users that owned land riparian to a public stream. The 1913 Water Ordinance and subsequent water legislation vested the ownership and authority to allocate public water in the hands of the settler state. This shift in ownership benefited the nascent European farming sector, whilst it assisted in denying African furrow irrigators their share of the water cake. Only those African irrigators that were properly supervised and controlled inside one of the government-initiated African irrigation schemes could beneficially use public water. But even then, their priority of use was limited to fellow Africans as demonstrated by the exceptional clause contained in the Nyanyadzi scheme water right allocation. Thus the same principle of racial segregation and prevention of African competition that applied in land was achieved in water, partly mediated by the fact that only free hold land owners could apply for water rights on their own account. The closure of African owned furrows and eradication of existing practices of wet land cultivation was legitimised on account of their assumed wasteful, destructive and inefficient nature.

In contrast furrow irrigators claim water is owned by nobody except God. Everybody with land near a public stream is allowed to abstract water through the investment of labour and capital. Various cultural and political idioms are mobilised to claim water. After independence the political promise of free water and land was used to assert ownership over a share of the water. Throughout history clan leaders have claimed a say over the water either by means of landed investments (hydraulic property) or guardianship accorded to them by previous generations (ancestors).

Prior application versus proportional allocation

A second fundamental difference is encapsulated in the concept of fixed water shares versus that of proportionality. The mode of ordering embodied in the doctrine of prior *application* is that of sharing the water cake in fixed slices according to a predefined queue of approved beneficiaries. When the cake turns out to be smaller than expected nothing is left for those who came late. In contrast, furrow irrigators embrace the principle of 'giving each other chances', sharing the water cake, however small, proportionally amongst users that have land riparian to the public stream.

These two organising principles produce ramifications that affect the time, space and quantity dimensions of the network. The prior application doctrine requires the employment of a wide array of technologies of control to assess the size of the water cake (automatic gauges, hydrological zones), to establish the eligibility of the applicant (beneficial use), to monitor the abstraction rate (measuring device), and to enforce the proper order of turns during times of water scarcity (river inspector, upstream raids). Furthermore the doctrine has the delusory propensity to establish a fixed order on a highly dynamic resource. Thus

abstraction points are fixed in time and place, furrows have to be impermeable, and irrigated command areas and crops are pre-defined.

Over time the illusion of an ordered water supply has achieved the opposite of what it was intended to. Rather than assuring water supply and making its behaviour predictable, the network has produced increased levels of risk and unreliability. Alvord, without knowing the river, assumed it to be perennial and reliable, yet in many years the Nyanyadzi river could not honour the flow rates allocated to the scheme. The official network has been unsuccessful in regulating water abstraction at a catchment wide scale, since it failed to incorporate all water users. The increased knowledge base provided for by the automatic gauges after 1967 did little to increase the administrations hold over the water: the data on available flow and prevalent abstraction rates were sent to Harare and not readily accessible to local users and monitoring agencies (NRB, Agritex). During the post-independence era, the water administration gradually increased its hold over water abstraction in the lower and middle range of the catchment through the effects produced by upstream raids. More people applied for water rights. Gradually more water was allocated to right holders than was normally available, which combined with a lack of capacity to implement the priority principle, resulted in increased levels of insecurity experienced at the bottom end of the catchment.

In contrast the farmer furrow-network is less exclusive, more flexible in time and space and more in tune with the actual behaviour of flowing water. Furrows and weirs may be leaking water, but this is only to the benefit of downstream users. Command areas contract and expand in response to the available water supply. Cropping patterns vary in response to gendered needs and market opportunities. The abstracted water may be used for multiple purposes as and when the appropriator sees fit. Local water sharing arrangements are limited in geographical span, but through their time-based schedules have the advantage of being transparent and easy to monitor.

System versus network conceptions of flowing water

A third fundamental difference concerns what could be called a system versus a network conception of the resource water. The official network strictly separates and regulates water abstraction according to the different types of water flow available (normal flow, storm flow, ground water flow) as if these flows are part of independent sub-systems that are further dissected by the identification of separate hydrological zones. The different types of water flows are subject to different allocation principles. For instance storm flow captured in government dams may be sold to right holders at the discretion of the Provincial Water Engineer. A normal flow abstraction may only be used for the specific purpose it has been applied for. In the case of agricultural use any water that does not end up in the root zone of the irrigated crop is considered a loss or else as proof of wasteful use. This focus on hard systems produces a plethora of leakages that could be beneficially made use of to mediate water scarcities. Lacking an empirically established understanding of how these different types of flow interfere with each other, the official water-network can never aspire to fully control water abstraction.

In contrast, the farmer initiated furrow network inculcates a more sophisticated understanding of locally available water flows, that in some instances (Ruwedza) produces a semblance of the integrated water resources management practices aspired by the international water community. The open and permeable material characteristics of the earthen furrow network allows the capture of different types of water (river water, spring water, artesian ground water), whilst it produces various types of return flows that help to mediate the effects of

drought and contribute to the maintenance of the ecological integrity of the river system. Local appreciation of the behaviour of public streams also helps in limiting the catchment both geographically and socially to appropriate scales. Thus the Ruwedza valley furrow irrigators do not consider water users downstream of the Ruwedza gorge stakeholders to their water. It remains to be empirically established, but it seems that the Ruwedza river indeed contributes little water to the base flow of the Nyanyadzi river, and thus any attempts at sharing Ruwedza water with users downstream would prove impractical. The same goes for attempts to bring Nyanyadzi river water flowing through village 12 to the scheme's intake. Whilst legally justified, such diversions of river flow yield little.

Different ways of dealing with calamities (water scarcity, floods)

The official management model is ill equipped to deal with water scarcities and storm floods for a variety of reasons. First of all the administering agencies are thinly represented on the ground, seriously impairing the implementation of the priority right principle. The one river inspector employed by the provincial DWD office had to monitor a vast area and was mostly office bound due to lack of transport. The one NRB officer for Chimanimani district not only covered a vast area, but also a vast number of natural resources. His capacity to monitor abusive use of natural resources was further limited by a lack of political backing. Thus the actual policing of water abstraction was left to Agritex. Yet, on the issue of water abstraction a conflict of interest existed between the extension workers seeking to commercialise smallholder farmers in the catchment for which access to water was essential, and their colleagues operating in Nyanyadzi scheme, who depended for the successful execution of their work on the strict implementation of the priority right allocated to the scheme. The legal framework offered several clauses to institute self-regulation, either by the formation of a river board or the declaration of a combined irrigation scheme.³⁶ Yet none of these forms of self-regulation were applied in Nyanyadzi catchment, mostly because the majority of water users challenges the legitimacy of the Water Act.

Secondly the measurement infrastructure that forms the basis of volumetric water distribution in times of scarcity is not transparent and relies on particular forms of expertise not available to the average stakeholder. Both European farmers and furrow irrigators can not 'read' their v notches and flumes. Moreover the stakeholders don't have access to the water supply data generated by the automatic flow recorders situated at strategic points on the river network.

Thirdly, the emphasis on fixed, watertight technologies does little to mediate the devastating effects of storm floods and the increased silt loads contained in Nyanyadzi river water. Thus the continued reinforcement of the Nyanyadzi intake weir has cost the government considerable resources, whilst achieving little. During the devastating floods of 1942, and again in 2000 (cyclone Elaine), the intake works were wiped out, whilst requiring continuous repair as a consequence of less intensive floods. The very permanence of the scheme's intake has produced another undesirable side-effect: the intake acts as a silt trap, requiring annual desilting work.

In contrast the furrow-network is better positioned to deal with floods and scarcities. First of all the span of the network is commensurate to the available water supply. The irrigated command at both plot and furrow level contracts during times of scarcity, whilst it expands during times of plenty. Secondly, the material characteristics of the network favour capture of

³⁶ By declaring to form a combined irrigation scheme water right holders could pool resources and devise their own arrangements for water allocation and distribution.

water from multiple sources, whilst the permeability of weirs and earthen furrows tends to favour equitable sharing of water. The same impermanence of these structures tends to minimise flood water damage. After floods weirs can be easily rebuilt and furrows re-laid. During extreme water scarcities time-based water rotation schedules may be instituted that are primed on proportional water allocations. Yet, the span and modalities of such water sharing arrangements varies, depending amongst other things on the conception of the catchment and the type of authority claim that can be mobilised. Despite the existence of social networks that span across the catchment, as reflected in the various kin-relationships that exist between upstream and downstream water users, these are not mobilised as basis for catchment wide collective action.

The basis for collective action: rules, incentives, accountability, cultural repertoires

Outsiders and Zimbabwean government officials often mis-diagnose the informal, *ad hoc* management practices of furrow irrigators as a sign of institutional failure, which supposedly leads to inefficient resource use and environmental degradation (Cleaver 1998, Turner 1999). Recurrent local conflicts over resource allocation and use are taken as further evidence of a lack of proper and efficient institutions (Turner 1999, 650). A common policy prescription in such instances is the imposition of legal rules of ownership and access to both land and water resources (Platteau 1994), thus bounding land and water use and removing the local flexibility and adaptivity that the Ruwedza valley water-network achieves (*cf* Ambler 1991, Nemarunde and Kozanayi 2003, 205).

Collective action is not inspired by clear-cut rules and institutional incentives (*cf* Ostrom 1990, 1992), but rather hinges on the degree of water scarcity experienced and historical emergence of social networks mobilising various authority claims (Berry 1993, Mosse 1997). What is striking about the forms of collective action surrounding water distribution and furrow maintenance practised by furrow irrigators, is the lack of formal organisations (no furrow committees), its *ad hoc* nature, and the great variety of culturally informed repertoires that are drawn on to establish a modicum of accountability (*cf* Cleaver 1998, 2000). Different perceptions exist of community and span of the local network of users mediated by a variety of leadership idioms. Thus the Ruwedza traditional leadership for a long time crafted and monitored water rotation schedules amongst the different furrow irrigators on the basis of their hereditary claim to the land. The same idiom of clan-based leadership was invoked by the Chirongwe clan in village 12 to organise the maintenance of their furrow and implementation of water rotation schedules amongst the various users of the furrow. In contrast, Chiambiro and his fellow furrow users in village 12 worked out a schedule of maintenance and water distribution that is based on proportional contributions of each irrigating household. Marowa exploited the top end position and prior appropriation of the irrigation furrow he used, to settle a cousin, sell water to a downstream settler and deny water to the furrow of another settler. The kaleidoscope of leadership allegiances that exists in communal and resettlement areas calls for a sophisticated approach towards issues of accountability and representation.

Raids only occurred when the water supply dwindled below the volume allocated to the scheme, whilst there was still a prospect of more water being available upstream (*cf* Wade 1988). Whilst both the raids and water sharing arrangements negotiated by the DA were ineffective in bringing water to scheme, the raids were instrumental in spreading the legal discourse and allocation of water rights from the Nyanyadzi intake in upstream direction. Thus the span of the official network gradually increased, yet the absence of a monitoring

agency that is recognised by all precludes its effectiveness in distributing water in a fair manner across the catchment during times of scarcity.

Outcomes: productivity, sustainability, equity

In terms of productivity Nyanyadzi plot holders and furrow irrigators are roughly at par. The yields attained depend on the mobilisation of labour, inputs, and available market outlets. The latter in particular are mediated by the accessibility of the irrigated command. Crop contracts tend to be given to those irrigators with easy access to the road network, though proven reliability and capability to deliver the produce also plays a role. The nature and open access character of the river network favours the use of water upstream rather than downstream during periods of low flow.

In terms of financial sustainability a big difference can be observed between the Nyanyadzi scheme, which produces agricultural output at a high price, and the furrow irrigators that produce for the export market and increase local levels of food security at no cost to government. Environmentally different effects are produced by the two networks, depending on the local mediation of access to river water and river beds and the type of soils available. In Ruwedza, the headman has succeeded for a long time to control the potentially destructive effects of streambed cultivation. In other locations of Nyanyadzi catchment, notably in Tiya (During 1995) and Shinja resettlement scheme (Schreurs 1998), increased population and livestock pressures have produced high levels of siltation mostly originating from sheet erosion. Neither the official network nor the indigenous network has a conclusive answer to such ongoing processes of environmental degradation.

In terms of equity the official network has a propensity to favour established and proven beneficial use over the extended use of available water to new comers. Before independence the legal framework served to appropriate and allocate water along racial segregationist lines, legitimised by various discourses. Thus access to public water in Zimbabwe was heavily biased to a limited group of commercial farmers who owned up to 70% of the allocated flow rights. In Nyanyadzi catchment the balance of access was less uneven, due to the large water allocation for the Nyanyadzi scheme. Furthermore the exodus of European settler farmers at the end of the independence war, and subsequent re-appropriation of European farm land by squatters and officially resettled smallholders has resulted in the rather unique situation of Nyanyadzi catchment, where up to 95% of all river flow has been allocated to smallholder farmers.

The furrow network allows more equitable access to water, though its access is gendered according to the type of water used, crops grown and scale of the undertaking. In general women have access to bucket and spring water irrigated gardens, whilst men mediate access to irrigated land that is commanded by furrows. As shown by the Ruwedza case study, access to furrow irrigated land gives rise to local processes of socio-economic differentiation. Often those furrow irrigators who enjoyed the benefits of prior access to irrigable land protect their hold over this valuable land against newcomers by invoking various idioms of legitimation, which are informed by a traditional claim over the land (*cf* Woodhouse 2002) or are derived from the Water Act (e.g. possession of a v-notch may strengthen one's claim over water).

The missing links of the Zimbabwe water reforms

The basic tenets of the 1998 water reform were in line with three globally endorsed shifts in water governance. Firstly, the basis of water management was shifted from administratively defined units (province, district) to the unit of the river basin. Secondly, the management of

the water was decentralised from the government to (sub)catchment councils constituted by local stakeholders. Thirdly, public water use was priced allowing the emergence of market based allocation mechanisms. However, the new Water Act and institutional configuration did little to bridge the gap between legality and reality.

Since all previous right holders automatically qualified for new water permits, little room has been offered for a redress of water access in overcommitted catchments or a recognition and inclusion of *de facto* water users (Manzungu 2001). Furthermore application fees for new water permits (US\$40) have been prohibitive to smallholder farmers (Kujinga 2001).

The new institutional set up has been heavy at the top, but thin on the ground, resulting in poor stakeholder representation and limited institutional effectiveness. Besides widespread ignorance of the new institutional dispensation, SCCs have employed few operational staff and user representation has been organised according to existing land use classifications, largely excluding poor smallholders³⁷ and women (Chikozho 2002, Derman *et al.* 2000, Mtisi and Nicol 2003). Whilst the pilot catchment councils in Mupfure and Mazowe both added a third tier to the institutional structure to generate meaningful participation from the grassroots,³⁸ neither these new bodies nor existing water governance bodies (such as IMCs and village borehole committees) have been legally recognised. Downward accountability was further impaired by the overriding authority of the Catchment Manager, a ZINWA employee, and the geographical span of SCCs, covering areas of up to 2,000 km² (Bolding *et al.* 1999, Derman *et al.* 2000, Manzungu 2001). Thus Odzi SCC includes five separate river catchments that mouth in the Odzi (including Umvumvumu and Nyanyadzi), but otherwise share little hydraulic interdependence. None of the furrow irrigators in Nyanyadzi catchment are represented, rendering the SCC ineffective as a potential mediator of the frequently occurring water conflicts.

The institution of water levies by both the SCC and ZINWA³⁹ was contested (Bolding 1999, Sithole 2000, Derman and Ferguson 2003, Mtisi and Nicol 2003). True to their reputation, Nyanyadzi irrigators refused to pay, saying:

'that they do not want anything to do with SCCs, CC and ZINWA. They said the whole idea of setting up these structures is to make them pay for water that comes from God (...) Nyanyadzi irrigators also asked a meeting with the President of Zimbabwe so that they can tell him that water does not belong to him but to God.' (Kujinga 2001, 131, 133)

³⁷ Communal and resettlement farmers are exclusively represented by ZFU members (Manzungu 2001).

³⁸ Water User Boards in Mazowe (Chikozho 2002) and Ward Water Associations in Mupfure (Bolding 1998).

³⁹ In 2001, the levies for abstracted river water were Z\$5 (US\$0.10) and Z\$40 (US\$0.80) per ML for Odzi SCC and ZINWA respectively. ZINWA charged Z\$270 (US\$5) per ML abstracted from government dams (Kujinga 2001, 133).



Photo 18: MDC office in Chimanimani, January 2003
(Source: Alex Bolding photo)

CONCLUSION AND DISCUSSION: THE RISE AND DEMISE OF AGRICULTURAL MODERNISATION

This study has sketched the contours of contrasting paradigms of agricultural modernisation at field, scheme and catchment level. Sharp contrasts can be observed between imposed models of modernisation and those developed by the subjects of these models themselves. This study has sought to address the following question:

'How did state engineered intervention models for agricultural modernisation of smallholder farming emerge and which continuities and outcomes did these models produce at three hydraulic levels (field, scheme, catchment) in Nyanyadzi river catchment?'

Most of the continuities and outcomes produced by the modernisation models have been presented in the preceding chapters. Therefore I limit myself in the first part of this conclusion (10.1) to some of the pivotal continuities and outcomes by assessing the contested character of the models, as expressed by the contrasts in modes of ordering of the models and the opposition and emergent forms of re-appropriation that they engendered. Some suggestions for reform of the models to bring them more in line with local practices are also made. Second, some pointers are provided for an alternative way of analysing and crafting water-networks drawing on the strengths of an interdisciplinary focus engrained in technography (10.2). Finally a brief interpretation of the likely impact of the Zimbabwe crisis on smallholder agriculture is given by presenting the winners and losers of the crisis and assessing the future of agrarian modernisation in Zimbabwe (10.3).

10.1 CONTINUITIES AND OUTCOMES OF MODERNISATION MODELS: CONTRASTS

The master farmer model: the emergence of a farming elite and bureaucracy committed to modernisation

The exact features of the master farmer model may have originated from the visionary ideas and missionary zeal of its originator Alvord, but the practices it promotes reflect those contained in the small farmer model that has been propagated throughout Africa by international funding agencies and national extension services as the panacea to poverty alleviation and sustainable increases in agricultural productivity (Ellis and Biggs 2001; Rockstrom 2000, Sumberg 1998, Wolmer and Scoones 2000; Woodhouse 2002). The defining feature of the model, maximisation of agricultural production per unit of land, was strongly informed by the racial land segregation policy and emerging conservationist discourse after 1930. Alvord's model of modernisation was only supported on the back of its potential to allow for the permanent squeeze of Africans in Reserves and to control the emergent erosion menace in the Reserves produced by over-population and over-stocking.

The limited scale of the model and lack of opportunities in the Reserves to expand farming operations and to engage in profitable business ventures precipitated an escape of master farmers from the Reserves, to Native Purchase areas, irrigation schemes and towns. The

officers making up the core of the post-independence extension service Agritex mainly originated from the ranks of successful Purchase farmers and closely identified with the merits of the modernisation model that had facilitated the escape from the Reserves of their parents. To them the modernisation model had taken on a rather personal significance in the sense that it had allowed for the accumulation of wealth through agricultural production and investment of part of that wealth in the education of themselves. This explains in part why the master farmer programme remained a core element of agrarian interventions after Independence.

Both the colonial and post-colonial state fostered the emergence of master farmers as a 'class' of elite farmers. The Rhodesian regime thus hoped to create a loyal class of yeomen peasant farmers in the Purchase Areas. However, their numbers were too small to make a substantial political impact. The post-colonial state fostered their move to resettlement schemes in order to prop up smallholder production, whilst at the same time legitimising and limiting further attempts at desegregation. Furthermore Agritex extension workers, like extension workers in other parts of the world, have a natural inclination to concentrate their efforts on wealthy farmers, since they provide the best bet for success and thus help in legitimising their efforts. Considering the resources required to make the mixed farming model work (water, livestock, capital and labour) it is not surprising that most of the master farmers were already well-endowed farmers before they embarked on the programme. The celebration of the agricultural success of master farmers at field days and agricultural shows only serves to legitimise state intervention. The trickle-down effect that master farmers were intended to ignite did not occur since most smallholders residing in communal or resettlement areas lack access to some of the critical resources to make the model work. Thus the aim of commercialising smallholder farmers and eradicating poverty through mimicking large scale commercial farmers at a small scale fell on deaf ears. Rather the opposite occurred. Master farmers used their status of good farmers and their intense interactions with their local extension worker to further their access to resources provided by the state and other outside agencies (NGOs, donor organisations, agri-businesses).

As shown in this study and others (Berry 1993, Hounkonnou 2001, Woodhouse 2002, 2003) master farmers and other smallholders pick from the mixed farming model whatever suits their own particular farming style, capitalising on geographically mediated access to resources and market niches. This calls for an ongoing diversification of the programme in order to cater for different farming styles. Rather than contributing to the thread-mill of market and technology induced farmer innovation that capitalises on a uniform model of farming practices and the availability of service and marketing institutions that has proven so successful in the West (Roling 2003, Roling *et al.* forthcoming), the extension and research service could focus on local 'windows of opportunity' that are spatially and socio-economically differentiated. As shown in chapter three, intensive interactions between smallholders and extension agents do facilitate processes of mutual learning, allowing for the calibration of ideal typical farm models with local repertoires of sustainable farming. In that sense the master farmer training programme is still the most intensive form of knowledge exchange and interaction at the disposal of Arex (the successor to Agritex). This calls for further strengthening and reform of the department to cater for a variety of pathways of agrarian modernisation and development and a variety of 'clients' (see IAC 2004). Since master farmers and other well-endowed smallholders are keenly aware of the spatially differentiated opportunities offered by the market, the challenge for public sector agencies lies in re-orienting their efforts from Alvord's 'heroes of progress' to smallholders that rely on a variety of livelihood practices (Bolding *et al.* 2003).

The irrigation factory model: African opposition and re-appropriation

Alvord's modernisation model at scheme level was successful in Nyanyadzi in contrast to its failure in the Reserves, partly because Alvord and his Mount Selinda network of modernist staff could craft the network from scratch. However, whilst the Save valley irrigation schemes succeeded in eradicating famine in the Save valley, they also produced unintended effects such as the extinction of the high land-low veld barter trade and the transfer of wealth from rain-fed farmers to irrigating plot holders, thus transforming the existing socio-economic and physical landscape of the *Ndaus*. The transfer of wealth allowed for the emergence of an elite class of modernist irrigators as aspired by Alvord. However, the very plot holders that were responsible for the success of modern irrigation took the model to its logical conclusion. They felt constrained in their modern aspirations for better education, wages and business opportunities by reluctant Administrators and strict Agricolas operating within an egalitarian and control idiom respectively. This resulted in the violent expression of African Nationalist opposition during the early 1960s.

The ensuing tug-of-war between Agricolas and Administrators on the future modalities of the scheme resulted in a compromise that furthered the development of the water-network along the lines of an irrigation factory. Agricolas wanted to emulate the success of the scheme by means of the construction of an expensive dam, which could only be financed on the back of sustained government control and raised water fees. Administrators wanted to squash African nationalism by imposing strict control through Tribal Land Authorities. The road to an irrigation factory in Nyanyadzi was not linear. At three separate occasions the management considered hand-over of the scheme to its users. However in all cases government withdrawal was abandoned on account of political and cost recovery considerations.

The strict management style was continued after independence by a generation of committed African managers, despite the fact that it was firmly at odds with the donor instigated policy discourse on the benefits of user management and nationalist promises of free access to resources and responsive governance. The lack of political support and effects of neo-liberal policies precluded the revival of Nyanyadzi as a factory scheme, and ultimately resulted in the abrupt hand-over of the scheme to the users by default. Initially it seemed the Nyanyadzi irrigators were not capable of running the scheme themselves, since they failed to pay for the electricity costs of the pump station. However, upon closer examination two contrasting cross-generational accumulation patterns and three modes of appropriation applied by different users of the water-network come to light. These different modes also reflect existing political differences in the scheme, which emerged during the war of independence and have resulted in internal divisions that are articulated through the platform provided by the Irrigation Management Committee.

Traditionalists in block C operate within a clan-based mode of appropriation and accumulation of wealth, that is typical for the African indigenous irrigation paradigm. Their 'investment' in cattle and wives as well as their autochthonous origin has allowed them to re-appropriate their part of the water-network as a community irrigation scheme. The inter-married status of the leading clans in block C has contributed to the emergence of effective forms of collective action taking care of the marketing of tomatoes grown under contract and the mobilisation of labour to maintain the frequently silted main canal. In order to re-assert control over block C the leading kraalhead has mobilised a variety of discourses that fuse the promises of the war, ancestral authority and membership of the Irrigation Management Committee into a consistent claim on the water-network. Thus the irrigating clans of block C have successfully managed to split their part of the network from the other blocks.

Modernist plot holders have used the irrigation scheme and the wealth it produces as a spring-board for the launch of an urban based generation of professionally employed sons and daughters. These in turn have facilitated the sustained operation of the scheme in a highly productive mode in blocks A, B and D. Through the formation of an NGO they have also succeeded in luring donors to the scheme to solve its water woes. This has resulted in the construction of a lined main canal by means of which modernist plot holders in blocks A, B and D express their preference for gravity water supply and emphasise the integrity of the scheme.

The political appropriation strategy that has been applied by the heirs of an evicted plot holder relies on a combination of relations with ZANU(PF), use of violence and political arm-twisting of court orders, providing a preview to events at a national scale accompanying the land invasions of 1999 and after.

The anti-thesis to Wittfogel: African irrigation and opposition

When one compares the lives of irrigated settlement schemes in Nyanyadzi, Mwea and Office du Niger a striking resemblance comes to light with respect to the introduction of irrigated production in the factory mode and the emergence of African (nationalist) opposition. Could it be that irrigation at a certain scale sows the seeds of national opposition? Such a proposition would constitute the anti-thesis to the inherent relationship between large-scale irrigation works and the rise of despotic regimes in the Orient, that Wittfogel (1957) observed.

Yet, there is a growing body of evidence which points at a propensity of irrigation factories of various scales on the African continent to breed the leadership and oppositional impetus to overthrow despotic (colonial) regimes. Evidence from this study on Nyanyadzi shows that the first generation of upwardly mobile modernists revolted against the colonial regime during the period of open African Nationalism, supporting the first political killing of a white Rhodesian since the end of the Shona rebellion in 1897. The next generation of modernist sons and daughters enlisted *en masse* in the liberation army to fight against the Smith regime, and the present generation, whilst being politically divided, stands in firm opposition to the imposition of dictatorial rule. In Mwea too, there are indications that its demise as an irrigation factory was not unrelated to the growth of a credible national opposition that won the 2002 elections under the banner of the Rainbow Coalition. The leaders that were in charge of the Mwea Producers' Co-operative, that refused to deliver paddy to the rice mills of the National Irrigation Board in 1998, were all affiliated to one of the opposition parties that was included in the Rainbow Coalition (Kabutha and Mutero 2002).¹

The most credible example of the anti-Wittfogel thesis is provided by the Office du Niger, in Mali, where the producer co-operatives that were closely associated with the political opposition of the day, literally starved the Traore dictatorship out of office in 1992 by refusing to deliver their paddy to the management's rice mills (Musch 2001, Aw and Diemer 2004).

¹ See newspaper reports in the *East African Standard*, 'Rice crisis brews a storm, Mwea constituency, Kirinyanga district', 1 November 2002. The role of opposition MPs in the Mwea revolt is reported on in *The Nation*, 'Violence won't end farmers' woes', 13 January 1999; 'Farmers rice saga began in March', 15 January 1999; 'Anglican Church Archbishop, MPs hold talks on Kenya rice crisis', 7 February 1999; 'MPs angered by farmers' beating', 7 August 1999; 'Mwea MP says no to rice imports', 5 September 1999; 'Farmers gained, says MP', 25 September 1999.

Integrated water resource management: contestations in the catchment

At catchment level the emerging intervention model aimed at a racial shedding of the waters, securing access to a critical resource for the agricultural development of the Rhodesian settlers. In that sense the Water Act of 1927 and its later versions can be seen as the segregationist counterpart of the Land Apportionment Act of 1930. Through the principles of prior *application* and tying of water to private land the resource could be secured for the exclusive use by Rhodesian settlers, whilst Africans could only get hold of a share of the water cake in government controlled irrigation settlements. Conservationist concerns informing the intervention model at catchment level were expressed in the Natural Resources Act of 1942, which explicitly prohibited wet land cultivation on account of the perceived damaging effects it produced for the environment. The Nyanyadzi irrigation project was instrumental in effectuating the mode of ordering contained in the model in the upstream catchment. African irrigation furrows were forcefully closed on several occasions on account of their perceived wasteful nature with help of the special clause contained in the water right granted to Nyanyadzi project.

However, the effectiveness of the official network to control the actual abstraction of river water was impaired by its limited institutional and geographical span and a lack of technologies of control. In the more remote and inaccessible parts of the catchment white farmers facilitated the sustained operation of irrigation furrows by their African labour tenants. Moreover little was known on the actual availability and behaviour of the water, even after the establishment of automatic flow recorders on the river in the late 1960s. The capacity of the water administration to control existing water use was increased after the second world war through the appointment of NRB officers and Land Development officers, and in Nyanyadzi the hydrological investigation in the early 1950s. Yet full control remained elusive. The water administration has at best been following rather than prescribing water use.

As shown in chapter nine the official water-network at catchment level caused serious disruptions in prevalent African agricultural practices that relied on a spatially and socio-economically differentiated variety of wetland cultivation, upland cultivation and (non)agricultural livelihood pursuits. The prohibition of wetland (*matoro*) cultivation and control over African irrigation furrows presented the most pernicious challenge to African smallholders in the research area. Their combined impact in limiting the 'peasant option' was bigger than those of other colonial interventions. This is demonstrated by the explosive boom in the proliferation of indigenous irrigation furrows that took place after Independence on the back of African nationalist promises of free farming and free access to water.

The modes of ordering that inform the African irrigation furrow network contrast sharply with the principles underlying the official catchment model. African smallholders perceive water to be a God-given resource, which can be appropriated through the investment of labour by riparian land owners (thus creating hydraulic property). The same principle initially guided the pioneer settlers that carved out farms in the upper end of the catchment. The modes of appropriating water by furrow irrigators draw on a variety of different political, ancestral and productive idioms. These inform the modes of ordering flowing water in African furrow networks and modes of organising operation and maintenance. Thus the proportional distribution of available water is stressed (through time-based rotation schedules) and the material characteristics of the furrow network allow for maximisation of water capture, whilst mitigating the destructive effects of floods and droughts (*vide* Ruwedza

case). This mode of ordering, though limited in span, espouses some of the core principles of integrated water resource management that is condoned in international policy circles.

After independence the vestiges of the official catchment model were continued as reflected in the upstream raids organised by the management of Nyanaydzi irrigation scheme. However the new political dispensation undermined the effectiveness of the raids. The principles informing the official model as well as the negotiated water sharing arrangements between upstream and downstream users have not produced sustainable catchment water management practices that are commensurate with the different normative frameworks, productive qualities and environmental requirements of its various users. The new model of catchment management that emerged from the Zimbabwe water reform process is unlikely to mitigate these existing differences. Despite the fact that the principles of proportional water allocation and user involvement in water management are commensurate with the modes of ordering of furrow irrigators, the principle of state ownership of the resource and the application of water pricing mechanisms in the distribution of the resource are actively contested by furrow irrigators.

The refusal of Nyanyadzi irrigators to pay for water, their denouncement of the Odzi Sub Catchment Council and the partial subsumption and representation of *de facto* water users in Nyanyadzi catchment in the new institutional dispensation, has seriously hampered the effectiveness of the new Water Act and ZINWA. The effects of the water reform were further compounded by the emerging economic and political crisis in Zimbabwe (see below).

Lessons for reforms in water-networks operated by smallholders

What lessons for water and irrigation reforms does this study contain? Below I provide a number of entry points that could inform future network builders.

First, this study stresses the importance of the 'energy equation' in smallholder irrigation. Present attempts at technological modernisation of irrigation schemes often rely on the mobilisation of considerable amounts of energy (pumps) that introduce dependencies on outside agencies (pump repair) and require the continuous mobilisation of human, financial and material resources. In contrast African indigenous irrigation ventures are informed by their simplicity and minimal use of energy sources, that can be locally mobilised (labour, local materials).

Second, the dynamic nature and kaleidoscope of available repertoires of user organisation call for an empirically informed strategy of crafting user involvement in the management and maintenance of water-networks. There is a need to go beyond the assumed universal validity of 'design principles' (whether informed by technical, neo-institutional or neo-liberal rationalities) informing policy models of user organisation, such as the universally promoted Water User Associations.

Third, rather than promoting and designing water-networks that assume and promote the emergence of a class of full-time irrigation farmers, the complementary nature of irrigated production should be taken into account. This would contribute to the avoidance of the 'dependency syndrome' that is so often lamented in the international aid world and minimise the risks that are associated with full-time irrigation production.

Fourth, intervening agents like donors and international funding agencies tend to focus their efforts to transform the modalities of smallholder irrigation on actors associated with the

state. The Nyanyadzi case shows that whilst such efforts enhance the capacity of the state to construct new irrigation schemes along the lines of the internationally adopted discourse (stressing user management), these efforts do not contribute to viable forms of water management on the ground. There is a need for donors to go beyond the state. This observation produces serious implications for the existing expert driven 'workshop culture', which is presently inaccessible for the beneficiaries (frontline staff and smallholders) it is supposed to address.

Fifth, this study stresses the importance of the maintenance of water-networks as an entry point for understanding and analysing emergent forms of user appropriation, particularly in the context of rehabilitation programmes. Present decentralisation policies that seek to institute user involvement in the management of water-networks tend to focus on water distribution rather than maintenance. It is my contention that a refocus on maintenance could elicit more useful entry points for sustainable and successful user management.

Finally, the technography of Nyanyadzi scheme and comparisons with Mwea, in Kenya, and Office du Niger, in Mali, qualify the merits of the neo-liberal and neo-institutional recipe informing their current reform. This study strongly advocates further research on the cross-generational accumulation patterns and emergent modes of appropriation that the inhabitants of these irrigation factories have pursued. It could well be that the successful transformation of the Office du Niger scheme can to a large extent be attributed to ongoing processes of user appropriation.

10.2 THE INTEGRATION OF DISCIPLINES AND HYDRAULIC LEVELS: SOME POINTERS

Rather than presenting a whole new outline for an interdisciplinary approach towards the successful crafting of sustainable water-networks, I will identify some pointers that could provide useful entry points informing such an approach. First I present some pivotal contrasts in dealing with water between imposed and indigenous modes of ordering that inform the builders of water-networks. Second, some ideas are presented that could inform future interventions.

Contrasts: control versus flow

This study has taken water as it moves through the hydrological cycle as its leading actor. Any attempt at controlling the flow of water will have to engage with the hydrological cycle, either by 'going with the flow' (i.e. wetland cultivation, rainfed agriculture) or by capturing (taming) the water by means of infrastructural works, disrupting its flow through the hydrological cycle. Whichever way, each form of water use produces (downstream) effects. The interaction between land and water also produces particular effects in terms of quantity and quality of water flows. These effects manifest themselves most clearly, though not exclusively, in the area contained within a watershed: the river basin, or catchment area. The crafting of a successful water-network depends to large extent on the capacity of network builders to capitalise of a number of characteristics of the resource water and its time, space and energy dimensions. Stark contrasts can be observed in this respect between state engineered water-networks and those which fall within the purview of the African indigenous paradigm. These contrasts cut across the various hydraulic levels.

The farming model advocated in the master farmer programme contrasts sharply with the opportunistic ways of smallholder farmers to respond to agro-ecological vagaries and its associated water dynamics. The master farmer model capitalises on the benefits of mixed

farming, use of high levels of inputs (chemicals, hybrid seeds, fertiliser), advantages of labour intensive forms of ploughing, mono-cropping, weeding and cultivation and the availability of markets. Thus the model introduces new dimensions of risk and dependence. Whilst the package can produce high yields per unit of land, it also assumes a high degree of control over labour, capital, land, and the timely supply of (rain)water. Yet such control often lacks, whilst the need for market outlets, input supplies, and timely mobilisation of labour introduces complex relations of dependence. In contrast smallholders pursue a farming style that is commensurate with their access to resources (e.g. land, labour, wage income, etc), whilst capitalising on the constraints and opportunities offered by the distribution of (rain)water in time and space through the employment of a variety of risk minimising practices. Thus a majority of smallholders in Zimbabwe practises staggered planting and inter-cropping, growing a mixture of subsistence and cash crops on a variety of different plots (wet land, dry land at different altitudes if possible), engaging in various non-agricultural livelihood pursuits (wage employment, craft making, etc.).

With regard to large scale irrigation settlements the question of energies required to convey and deliver water to the crops becomes paramount. Engineers, in their quest for control and technological sophistication have a tendency to mobilise increasing amounts of energy for the operation of their modern networks. The mobilisation of this energy (hydraulic head) requires the translation of many different elements (financial, material, human) into a working whole. Such translations often produce increased levels of vulnerability, dependency and risk, representing the opposite of what is aimed for. This fact is amply demonstrated by the fate of the pump operated irrigation schemes in Zimbabwe, that ceased operating as soon as a combination of neo-liberal policies and financial bankruptcy of the state impeded the mobilisation the necessary resources. In contrast African indigenous irrigation ventures and practices of wet land cropping all rely on gravity or energy provided by human labour. This makes them more durable and less risky, though admittedly also potentially less productive. The proliferation of the treadle pump technology across some African countries and success of farmer initiated irrigation furrows in the Chimanimani highlands can to some extent be attributed to this characteristic.

But there is more to water than the energy required to capture and convey it. The time-space dynamics of water, whether contained in a flowing river or an underground aquifer, also provide a challenge to network builders in the form of large variations in flows. The pendulum of floods and droughts becomes more extreme at a lower point in the river, though tributaries mediate in its distribution. Farmer initiated irrigation furrows in the Nyanaydzi catchment and other catchments work in line with this characteristic. The command areas that are contained in the network contract in times of scarcity, whilst they expand during times of plenty. At the same time the social boundaries of the network (collective action) expand during times of scarcity, whilst contracting in times of abundance. The flexible, non permanent set-up of the network is reflected in the temporary and simple nature of the technologies used. Stone weirs are flushed during floods, but can just as easily be rebuilt through the mobilisation of labour and stones. An advantage of the propensity of such stone weirs to wash away during floods is that the furrow system absorbs less silt than would have been the case with a more permanent structure. Earthen furrows tend to percolate substantial amounts of the water they have taken in, but such leakage is not regarded as a loss, since it feeds the flow of lower lying furrows and helps to maintain the ecological integrity of the river. The discharge of additional water from springs and leaking upstream furrows is captured along the furrow and used to augment the available flow. The spatial distribution of farmer initiated furrows across river catchments enhances their capacity to cope with drought

induced scarcities and enhances equitable access to a scarce resource. The time based rotation schedules enforced during times of water scarcity are another example of economising water that is based on the actual spatial distribution of its supply.

Again the engineering paradigm offers sharp contrasts. Engineers emphasize the control over water flows by means of the mobilisation of permanent allies: fixed concrete intake weirs, automatic flow recorders, and vast lined canal networks. Their conception of an irrigation system as a bounded entity in space and time, calls for the mobilisation of ever more powerful allies to direct water flows and economise on its use within a specified space. Yet the history of the Nyanyadzi water-network and other irrigation schemes proves the frailty of such attempts in hostile environments. Reinforced river intakes may still be washed away, yet they are not easily rebuilt. The very hardness (durability) of the intake structure may transform it in a silt trap. The technologies of control employed by the management to achieve high levels of output per unit of land as well as to maintain strict boundaries between the water-network and its environment depend on the mobilisation and translation of large quantities of energy and various types of capital (material, human, financial, social, political). Thus the water-network becomes dependent upon a variety of (f)actors introducing an element of risk and unpredictability, that paradoxically undermines the very control that is aspired for.

Experiences with irrigation factories in sub Saharan Africa show that technologies of control devised by the management tend to focus on land, labour and crop-commodity chains rather than water. This observation ties in with Berry's (1993, 101) conclusion that the agrarian question in Africa revolves turns on the scarcity of labour rather than land. Water, because of its tendency to flow, evaporate, and percolate proves difficult to control (Moore 1989), unless it is forced to operate in a closed network (such as a piped sprinkler scheme). The imperfect water control enacted by the management whether in its physical, managerial or socio-political dimension, allows the beneficiaries of these irrigation factories to eke out a living and re-appropriate parts of the network. This phenomenon occurs at schemes of different scales, though the possibilities for user manipulation of the water resource tend to increase with the size of the scheme. The imperfect degree of water control exerted by the management, stringent managerial forms of control over land, labour and commodity chains, and modalities of re-appropriation by the users along the lines of kin, labour, and inheritance patterns suggests the concept of water control and its three dimensions as proposed by Mollinga (1998) is ill-suited for the analysis of irrigated settlements within the context of Sub Saharan Africa. Whilst it makes sense to follow the water as an entry point for analysing the networks built around it, the modalities of controlling production practices and appropriating parts of the water-network are mediated through resources that are less fluid and fugitive than water.

The issue of scale and integration: networks and interactive prototyping

To deal with the issues of scale and integration of imposed models of modernisation with locally available idioms, I propose to adopt a networking approach towards the object of intervention and to develop an interactive prototyping approach in their design.

Benefits of a (water) network metaphor over a system metaphor.

Interveners, and in particular water engineers, suffer from a hard system conception of the object of intervention through which agriculture at field, scheme and catchment scale has to be modernised. Such a conceptualisation of the object of intervention tends to limit its scope, whilst increasing the array of technologies of control required to make the technology work.

This is clearly reflected in the failure of many donor funded projects and programmes to sustain success after the retreat of support by the parent agency, and the often elusive emphasis of intervening agencies on the need to scale up or copy successful models of intervention (Mollinga and Bolding 2004). In contrast a network conception allows both the intervener and the actual network-user to identify and benefit from cross-cutting mechanisms that drive and bound up distinctive water-networks to networks of a higher scale. This calls for a shift in emphasis of the interveners towards the embeddedness of a new technology in the existing landscape of interlocking networks, cultural dispositions and idioms of appropriation, rather than the preservation of the integrity of the prototype and wholesome translocation of the intervention model (cargo) in a different context at a wider scale (Long and Van der Ploeg 1989, Rap 2004).

Turning technography from an analytical tool into a tool for intervention

What is the use of technography in promoting the emergence of sustainable water-networks that are capable of producing tangible improvements in rural livelihoods? An attempt to answer such a question is bound to be modest, since my interest lies not in providing yet another universal policy recipe that can be presented as a panacea to Zimbabwe's or Africa's challenges. If anything, the technography of Nyanyadzi scheme has demonstrated the limited validity and relevance of analytical frameworks that aspire general explanatory value. So one caveat would be that a conception of human agency in terms of a universally valid rationality (primed on either economic, institutional, or technical imperatives) has to go. The building of a water-network is culturally informed and inspired by a variety of available dispositions and modes of organising. Technographic analysis could bring out some of the existing modalities that inform network builders. This implies for interveners that rather than investing time and effort in crafting a successful blue-print, time and effort has to be invested in developing a prototype *in situ*. Such interactive prototyping at local level does not automatically limit the scale or impact of the intervention. As is shown by this thesis, existing networks often prove fluid, multi-layered, and variable in scope and span. What it does imply is a targeted investment in diagnostic surveys and negotiation processes without denying the inherent political nature of such processes (Richards 2002, Röling *et al* forthcoming).

10.3 WHITHER ZIMBABWE? SOME IMPLICATIONS OF THE ZIMBABWE CRISIS FOR AGRICULTURAL MODERNISATION

Since the conclusion of my field work period in Chimanimani district, in August 1997, a lot has happened, both in the district and in the country at large. This is not the place to review the full extent and content of events that took place since the first list of farms appeared that were to be compulsory appropriated by the Mugabe regime in November 1997. My feeling is that such an attempt would require the writing of another PhD thesis, a task I gladly leave to others. Yet, the Zimbabwe 'crisis' and the gradual glide of the Mugabe regime towards despotic rule, has nagged me ever since I left the country in April 1998. The economic crisis is compounded by the ongoing AIDS epidemic that affects Zimbabweans of all classes in society. Taking my cue from Meredith's book (1980) titled 'The past is another country', I wondered of what relevance my research findings would be to the changed Zimbabwe of today. Could I have predicted what was coming, based on my field work in Chimanimani district? How did the crisis affect the agricultural modernisation project that was started by Keigwin and Alvord in the 1920s? What are future modalities of agricultural development in Zimbabwe? I won't claim to have any answers to those questions, but feel compelled to highlight some inklings of understanding, based on a visit to Chimanimani in January 2003,

recent publications on the Zimbabwe crisis, and a re-interpretation of my empirical material collected between 1994-98.

Winners and losers: who benefits from the Zimbabwe crisis?

Some authors (e.g. Shaw 2003) suggest that the Zimbabwe crisis can be understood in terms of a common propensity of African governments, that is 'the politics of the belly' (Bayart 1993). By means of this term Bayart describes the process of capture of the state by a political elite, that transforms the state apparatus and its resources into a giant patron-client network to promote the immediate interest of its patrons. Whilst it is undoubtedly true that several ZANU(PF) *chefs* (ministers, backbenchers and top brass of the army) have benefited from the Zimbabwe crisis by personally appropriating new means for capital accumulation (farms, mines, businesses) protected under the cloak of a regime that conveniently confuses state property with party property, I will assess the situation on the basis of the three patterns of wealth accumulation and associated modes of organising that this study found in Chimanimani district during the mid-1990s.

The politicians

Some of those who apply a politically informed accumulation strategy (referred to by the term politicians) are the direct beneficiaries and often instigators of the violent land invasions and resulting accelerated land reform programme. Many authors on the Zimbabwe crisis (Alexander 2003, Kriger 2003, McGregor 2002) have described the emerging alliance between the Mugabe regime and the rank and file of former freedom fighters (war veterans). The latter have to some extent captured the state and have been used by the Mugabe regime to intimidate the rural electorate and to violently chase white farmers and their labour force off the land. Modern institutions like schools, the civil service and rural district councils have also been subject to violent attacks, indicating that the unfolding crisis in Zimbabwe is about more than just the Land Question (McGregor 2002). As Alexander (2003, 114) notes the land occupations were about:

'a government effectively unravelling its own state with great vigour, and operating outside it through often fairly autonomous forces at district and provincial levels, led by veterans and ZANU(PF). The sustained political violence and attacks on the civil service and opposition in and after 2000 served to undermine radically the prospects for constituting an accountable state and a culture of political tolerance.'

Whilst the above seems to prove Bayart's point on the politics of the belly, it has to be stressed that not only war veterans and people associated with ZANU(PF) have benefited from the land occupations. Not all new land users are war veterans, and not all war veterans have benefited (Alexander 2003). Chaumba *et al.* (2003a, b, c) and others have shown that a variety of people from communal areas, including AIDS widows and the destitute, have also gained access to land. Moreover the application of a politically informed strategy of wealth accumulation is contingent on a good relationship with the ZANU(PF) elite, which involves a balancing act between towing the party line and going for personal wealth. The fluidity of political correctness calls for cautious strategising that is impingent on the rise and demise of ethnic divisions within ZANU(PF) and the outcomes of ongoing power struggles between different factions. In this fluid field of power shifts the winners of today may be the losers of tomorrow. Such at least transpires from the fate that befell several of the leading black business tycoons (indigenous businessmen) that were thrown in jail after being accused of corruption and graft.

Christian modernists: Alvord's modern men and women

Alvord's modern men and women stand to be the main losers of the Zimbabwe crisis. The collapse of the formal economy has swept away the foundation of the master farmer model. The collapse of agricultural service provision and lack of export markets has undercut the viability of commercial production. Furthermore the ongoing substitution of a technocratic meritocracy by party politics has resulted in master farmers losing their status as favourite recipients of state mediated resources. The Christian modernisers are forced by circumstances to revert to time tested practices of economising on the unit of labour rather than the unit of land available. The exodus of white collar workers from town to country may provide temporary relief on the availability of labour force, but negatively affects the income and input support that modernist irrigators and cultivators received from their urban kin. Even without the economic crisis, the AIDS epidemic has forced smallholders to economise on labour. The impact of the economic crisis is mitigated for those who are located close to population centres and capable of mobilising labour, water, inputs. The collapse of the formal economy and associated trends of devaluation and inflation has favoured those who produce tangible commodities. In some rural areas a barter economy has emerged. In such circumstances those smallholder producers with access to irrigation are relatively well off. This at least was the impression I got from my last visit to Nyanyadzi irrigation scheme in early 2003.

The traditionalists: the resilience of a 'spent' force that has come full-circle

The fate of those operating within a clan based traditionalist mode of accumulation and appropriation of resources falls somewhere in between that of the modernists and the politicians. The generic edge that polygamists have in terms of the clan based labour force they can mobilise favours their position, whilst the new land that has become available to those situated in communal areas neighbouring commercial areas has allowed some to expand their land base. The Traditional Leaders Act that was endorsed towards the end of the 20th century demonstrated that the relationship between the Mugabe regime and the traditional leaders has come full circle. Realising the importance of the rural electorate, ZANU(PF) has cautiously nurtured the status and authority of traditional leaders at the expense of bureaucratically and democratically constituted forms of authority and power.

Under the new political dispensation, the position of traditional leaders has been strengthened, reflecting a trend that was already going on by default. For instance, the grazing scheme in village 12 of Shinja resettlement scheme was actively undermined (wire-cutting) by various traditional leaders that wished to use the same grazing land to settle more 'squatters' in the village. The same trend was observed in many resettlement schemes by the Land Tenure Commission (GoZ 1994) Thus the traditional leadership and associated royal clans are getting a better hold over natural resources. In conclusion it can be observed that the Zimbabwe crisis has spelled doom for the Alvord initiated agricultural modernisation project and those associated with it. Below I will briefly refer to another legacy of Alvord: the agricultural bureaucracy.

Agricolas in the Zimbabwe crisis: caught in between

The civil service reforms of 2002 brought the former Department of Research (DR&SS) and the national extension service (Agritex) under one roof, in the department of Agricultural Research and Extension (AREX). The irrigation wing of Agritex was split and a tug-of-war ensued over staff control between the new Department of Irrigation in the Ministry of Water and the old but upgraded Department of Agricultural Engineering in the Ministry of Agriculture. In general government departments have suffered from a paucity of funds (from

both government and donor sources) and an accelerated brain drain amongst its officer corps. Another trend that has been reinforced by the Zimbabwe crisis is the Agricolas' hunt for degrees abroad.

The economic crisis and accelerated land resettlement programme have caught the average Agricola between two opposing currents. On the one hand the Agricolas still strongly identify with Alvord's agricultural modernisation project, as reflected in their training; the rationale of the two new models of resettlement that basically reproduce the previously existing duality of the agricultural sector; and the emphasis on high-input agriculture. On the other hand their task has been complicated by the collapse of the formal economy and the fact that most large scale commercial farms are occupied by new owners who do not enjoy the same level of skills, capital base and entrepreneurial farming spirit as their previous owners. Furthermore the use that is made of hybrid maize varieties has dropped. Increasingly smallholders are switching to open pollinated varieties of maize, that yield less, but are readily available and allow for the use of seeds from the previous year's harvest.

The role of Agricolas has been consistent throughout the history of the country. They relentlessly tried to increase agricultural productivity by promoting a mixed farming model that celebrates commercial cropping and high input packages. This inclination has driven them firmly into the fold of the opposition (MDC), since the present ZANU(PF) regime is associated with destroying agricultural productivity. On the other hand the Mugabe regime has been suspicious of its civil servants, as is testified by frequent warnings to vote ZANU(PF). During the first two decades after Independence the agricultural bureaucracy often proved to be an obstacle to radical land reforms, since Agricolas favoured agricultural output and productivity over political desires for redistributing the land. The sale of six commercial farms in the upper Nyanyadzi catchment by a land speculator to Border Timbers in 1996 is a prime example of this. Despite the fact that the farms were inhabited and productively used by scores of irrigating 'squatter' families Agritex Chimanimani considered the farms unsuitable for resettlement and vetted their sale to a commercial timber company (Van der Zaag *et al.* 2001, 267-9). During the land occupations of 2000 the situation was reversed and the Agricolas 'found themselves utterly side-lined: they were left to lament that the painstaking plans produced by their "serious scientific analysis of Zimbabwe's agricultural needs" were now 'dead'" (Alexander 2003, 113).

The situation in Chimanimani district in 2003 reflected this trend. The district was besieged by the state's security forces, who tortured anyone suspected of MDC sympathies. The terror campaign was most ferocious in Chimanimani, because a white farmer had won the Chimanimani seat in parliament for the MDC during the 2000 general elections (see Photo 18). The Agricolas were also more or less besieged. They were forced to implement the fast track resettlement exercise, which in Chimanimani involved the planning of farms for army personnel on former forest land. Such work was resented not only because some army officers gave instructions from the barrel of their gun, but also because of the future erosion menace contained in the chopping of the forest and cultivation on steep hillsides. Yet the fate of technocracy in Zimbabwe is ambivalent. In other districts, notably in south-eastern Zimbabwe, the deployment of the technical tools and discourses of land-use planning have been instrumental in securing the legitimacy of new settlers (Chaumba *et al.* 2003b), suggesting a revival of technocratic development policies.

The food shortage that threatens to occur during the month of the next general elections (February 2005) has prompted the Mugabe regime to reassert some of the vestiges of the

modernisation project. During a visit to Zimbabwe in July 2004, it transpired that the Agricultural Rural Development Agency (ARDA) has been transformed into a kind of super-department that has gradually asserted control over many expropriated commercial farms. Its staff numbers have increased manifold, whilst ARDA has enjoyed privileged access to inputs and irrigation equipment. Some of the extension workers that had been employed by Agritex in Chimanimani during the time of this study have switched jobs and joined ARDA. Many of the former commercial farms I encountered during my last tour through Zimbabwe were irrigating large stretches of wheat under the supervision of this new super-department.

The future of Zimbabwe's water reforms impaired

The neo-liberal and democratic foundations of the water reforms were both impaired by events on the ground after the launch of the third *Chimurenga*. The predominantly white commercial farming sector, which provided the financial pillar upon which the policy rested, has virtually disappeared and the feeble attempts at democratic forms of representation were seriously impaired by the security service's hunt for opposition members.

The combined effect of devolved financial responsibility and hikes in electricity prices has been that most pumped irrigation schemes have dried up. However, this rather sobering experience may produce beneficial effects in the future. Irrigators have become aware of their dependency on the government in a new way. The government has proven itself to be an unreliable partner, whilst pumping stations have once more demonstrated their propensity to make local communities and their water-networks dependant upon their wider socio-economic and institutional environment. Paradoxically, this may fuel farmer confidence and resilience by putting less faith in so-called experts and relying more on the elements and resources that they themselves can mobilise and muster to construct sustainable water-networks.

One of the criticisms levelled against the 1998 Water Act in this thesis and other publications (Derman *et al.* 2000), is that the new legal and institutional framework does not incorporate local conceptions and practices which are considered legitimate and fair. One effect of the Zimbabwe crisis may be that local communities actively pursue forms of water governance that better fit their own ideas and practices, as described for the Ruwedza case. The absence of a clear-cut institutional framework, such as the presently ineffective (sub) catchment councils, does not always imply the emergence of anarchy. Rather it may open avenues for a variety of local idioms and modes of organising around the use and distribution of water.

ENDNOTES

ENDNOTES CHAPTER 2

- ⁱ National Archives of Zimbabwe [NAZ] file SRG4: Report by H S Keigwin, esquire, Native Commissioner, presented to the Legislative Council, 1920, Salisbury, Rhodesia.
- ⁱⁱ Keigwin refers to Booker T. Washington and his Tuskegee Institute in his report to the Legislative Council, 1920, Salisbury, Rhodesia. NAZ, SRG4.
- ⁱⁱⁱ NAZ, SRG4, Report by H.S. Keigwin, Esquire, Native Commissioner, presented to the Legislative Council, 1920, Salisbury, Rhodesia.
- ^{iv} In this chapter, colonial names of Reserves are used when appropriate.
- ^v NAZ S138/69, Report of missionary tour, to Chief Native Commissioner, from Keigwin, Director of Native Development, 14 October 1922.
- ^{vi} NAZ S138/206, Letter from Keigwin to the Chief Native Commissioner, 30 January 1924. Reply from Minister of Native Affairs to the Chief Native Commissioner, 13 February 1924.
- ^{vii} NAZ S138/206 Letter from the Secretary to the Premier, to the Chief Native Commissioner, 11 July 1924.
- ^{viii} NAZ, S138/206, Training of Native demonstrators, report by Keigwin, to Chief Native Commissioner, 18 June 1924.
- ^{ix} NAZ, AL6/1/1/14, Letter from Keigwin, to Alvord, 12 August 1926. After his resignation Keigwin became Director of Education in Sierra Leone (NADA, 1963, 122).
- ^x NAZ, AL6/1/1, Letter from Mundy to Alvord, 6 May 1926.
- ^{xi} NAZ, AL6/1/1, Letter from Alvord to Mundy, 12 May 1926.
- ^{xii} NAZ, S138/69, Undated draft letter to be sent to the Transkei, by E D Alvord to the Chief Native Commissioner. Attached to Native Agricultural Demonstrators, letter from Chief Native Commissioner to the Secretary of Native Affairs, Pretoria, 2 January 1927.
- ^{xiii} NAZ, S138/69, Letter from General Council Agricultural Director, J W D Hughes, Umtata, Transkei, to the Chief Magistrate of the Transkei Territories, Umtata, 26 January 1927.
- ^{xiv} NAZ, S138/69, Scheme for work of Native demonstrators, Letter from Alvord to Chief Agriculturist (Mundy), 25 February 1927.
- ^{xv} NAZ, S138/72, Letter from Alvord to the Director of Native Education, 13 May 1929.
- ^{xvi} Sanders 1966; Scott 1970
- ^{xvii} NAZ, S138/206, Report on training of demonstrators at Tjolutjo, from Alvord to the Chief Agriculturist [Mundy], 13 November 1926.
- ^{xviii} NAZ, S138/69, Training of native farming demonstrators, circular letter No C 272/1927, from Chief Native Commissioner Jackson, to all Native Commissioners, 1 April 1927.
- ^{xix} NAZ, S138/69, Letter from Alvord to the Principal of Tjolutjo school, 16 September 1927.
- ^{xx} NAZ, S138/72, Report on Chiweshe and Chibi reserve trips from Alvord to the Chief Native Commissioner, 5 July 1927.
- ^{xxi} NAZ, S138/72, Report of progress of demonstration work, Chiweshe Reserve, from Alvord to the Chief Native Commissioner, 23 November 1927.
- ^{xxii} *Annual Report of Agriculturist for instruction of Natives*, to the Chief Native Commissioner, 14 January 1929.
- ^{xxiii} NAZ, S138/72, Letter from Alvord to the Director, Native Education, 13 May 1929.
- ^{xxiv} NAZ, AL6/1/1, Letter from Alvord to Chief Agriculturist (Mundy), 28 August 1928.
- ^{xxv} NAZ, S138/72, Letter from Alvord to Director, Native Education, 13 May 1929.
- ^{xxvi} NAZ, S988, NRB interview with Mr E D Alvord, 14 July 1942, Rusape.
- ^{xxvii} NAZ, S138/72/2, Letter from Superintendent of Natives, Fort Victoria, to CNC, 9 May 1931.
- ^{xxviii} NAZ, S138/72/2, Letter from Alvord to Director of Native development, 8 June 1931.
- ^{xxix} NAZ, S138/72/2, Letter from Alvord to Director of Native Development, 8 June 1931.
- ^{xxx} NAZ, S138/72, Letter from GEP Broderick, Principal Domboshawa Government school, to the Director of Native Education, 10 April 1929.
- ^{xxxi} S138/72, Letter from CNC to Director of Native Education, 30 April 1929.
- ^{xxxii} S138/72, Letter from Alvord to Director of Native Education, 13 May 1929.
- ^{xxxiii} NAZ, S1619, NC Ndanga, quoted in Ranger (1985, 62).
- ^{xxxiv} See S840/2/23, Letter from E.D. Alvord to L.M. Foggini, Education Department, 15 October 1921. S138/72, Report on 'Suggestions for agricultural instruction at government schools.', from Alvord to CNC, 23 July 1927.
- ^{xxxv} S138/72, Circular letter from the Agriculturist for Natives to all Native demonstrators, 21 December 1927.
- ^{xxxvi} S138/72, Letter from E D Alvord to the Director of Native Education, 13 May 1929.
- ^{xxxvii} NAZ, SRG3, *Report of the Director of Native Education for the year 1945*.

- xxxviii NAZ, S170/1161, Letter from Alvord to Director for Native Development, 4 December 1931. Letter from superintendent of Natives, Fort Victoria, to CNC, 16 December 1931.
- xxxix NAZ, S1050, *Annual report for the year ending 31st December 1938*, NC Victoria.
- xl NAZ, S2384/K5843/3236, *Overview of demonstrator work in Chiota Reserve*, District Land Development Officer Marandellas, 9 September 1947.
- xli NAZ, S2384/K5843, Individual allocation of land, Shiota Reserve, Land Inspector, 24 February 1943.
- xlii NAZ, SRG3, *Annual report of the Director of Native Agriculture for the Year 1948*.
- xliii Unless otherwise specified, the information in this box is derived from three letters. NAZ, S160/IP1, Letter from Secretary Shiota Leaders Association, to Alvord, via NC Marandellas, 4 July 1943. NAZ, S2384/K5843/3236, Letter from LDO Marandellas, to Alvord, 8 August 1945. NAZ, S2384/K5843/3236, Report from LDO Marandellas on Agricultural demonstration work, Chiota Reserve, Marandellas, 9 September 1947.
- xliv Interviews with E Chikazhe (retired demonstrator in Murehwa, started in 1946), on 28 June 1997 at Mount Darwin; with Kondo (retired demonstrator in Chiweshe, started in 1954) on 29 June 1997; and with B Mupinda (retired demonstrator in Makoni, started in 1950) on 9 March 1996, in Rusape.
- xlv Interviews with E Chikazhe (retired demonstrator in Murehwa, started in 1946), on 28 June 1997 at Mount Darwin; with Kondo (retired demonstrator in Chiweshe, started in 1954) on 29 June 1997; and with B Mupinda (retired demonstrator in Makoni, started in 1950) on 9 March 1996, in Rusape.
- xlvi Interview with Mrs Sigauke, hospital matron and wife of A Sigauke (retired community demonstrator in Mtoko), Harare, 19 February 1998. See also Weinrich (1973, 189-90).
- xlvii Interview with M Sigauke (retired demonstrator in Chakohwa irrigation scheme, started in 1942), Birchenough Bridge, 6 March 1998.
- xlviii NAZ, S2814/3585, Instructions on the allocation, occupation and preservation of plots on irrigation projects in Native Reserves, CNC, 5 October 1939.
- xlfix NAZ, S235/510, *Annual report for the year ending 31st December 1932*, aNC Goromonzi.

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- ⁱ NAZ, S1542/A4/5, Letter from Alvord to CNC, 18 March 1936.
- ⁱⁱ NAZ, S1542/D7, Letter from Alvord to NC Selukwe, 3 July 1939.
- ⁱⁱⁱ NAZ, S2401, Letter from Alvord to CNC, 19 November 1936.
- ⁱⁱⁱⁱ NAZ, S1542/D7, Letter from Alvord to CNC, 22 February 1938.
- ^{lv} See for instance NAZ, S1542/S10, Letter from NC Concession to CNC, 11 May 1939; S1542/D7, Letter from aNC Buhera, to NC The Range, 5 November 1937.
- ^{lv} NAZ, S1542/D7, Letter from Alvord to CNC, 4 January 1938.
- ^{lvi} NAZ, S988, Evidence of CNC Simmonds to the NRB, 19 November 1942.
- ^{lvii} NAZ, S988, Evidence of NC Stead to the NRB, Rusape, 14 July 1942.
- ^{lviii} NAZ, S235/483, Memo on Soil Salvation in Native Reserves, sent by Alvord to the secretary for Native Affairs, 25 February 1943.
- ^{lix} Native Purchase Areas were later called African Purchase Areas. After independence African purchase farmers became known as small scale commercial farmers
- ^{lx} Interview with D.C.H. Plowes, Mutare, 30 November 1996.
- ⁱ NAZ, S160/SN/33/48, List of all African staff of the Native Agriculture Department, June 1947.
- ⁱⁱ Information on Zito Sigauke's career was attained from Rennie (1973, 527-28) and three interviews with two of his sons. Interview with Amos Sigauke, Harare, 19 February 1998. Interview with Mathias Sigauke, Birchenough Bridge, 5 and 6 March 1998.
- ⁱⁱⁱ The other three were Hliziyo, Muyotcha and Mlambo, all from Mt Selinda mission and known as the Alvord trustees (interview with Amos Sigauke, Harare, 19 February 1998).
- ^{iv} NAZ, S1542/A4, Letter from Alvord, to CNC, 20 May 1936.
- ^v NAZ, S160/IP3, Letter from Zito Sigauke, to Alvord, 23 April 1945.
- ^{vi} NAZ, S160/IP3, Letter from Alvord, to NC Melssetter, 1 May 1945.
- ^{vii} Interview with Elijah Chikazhe, Chesa, 28 June 1997.
- ^{viii} Interview with M Kondo, Chesa, 29 June 1997.
- ^{ix} Based on Bolding et al. 2003.
- ^x Interview with Agricultural Extension Specialist on MFT for Manicaland Province, Mutare, 12 June 1995.
- ^{xi} Interview with the District Agricultural Extension Officer, Chimanimani, 9 May 1994.
- ^{xii} Letter from the production manager, Rusitu small scale dairy settlement scheme, to the training specialist,

Agritex Manicaland, 13 July 1993.

^{xiii} Interview with Agricultural Extension Officer, Chimanimani, 2 February 1995.

^{xiv} Based on various talks to Kenya Dube and interview with *Ambuya* Tendwa, Nyanyadzi, 14 February 1995.

^{xv} Letter from the Provincial Agricultural Extension Officer (field), to all District Agricultural Extension Officers in Manicaland, 20 September 1995. Agritex Chimanimani district files.

^{xvi} Interview with Lydia Chikazhe, Chesa, 28 June 1997.

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ⁱ NAZ, S160/IP1-4, Letter from Alvord to CNC, 1 August 1934.

ⁱⁱ NAZ, S160/IP1-4, Letter from CNC to Chief Engineer, 6 August 1934.

ⁱⁱⁱ NAZ, S160/IP1-4, Letter from Alvord to CNC, 7 August 1934.

^{iv} Interview with retired Irrigation Officer Watermeyer, Harare, 12 March 1996.

^v Interview with kraalhead Dirikwe, Nyanyadzi, 15 November 1994.

^{vi} Interview with retired irrigation supervisor Mahoneke Sithole, Mutema, 30 March 1996.

^{vii} Interview with extension worker Gwenzi, Nyanyadzi, 19 May 1994.

^{viii} Interview with *sabhuku* Robi, Chitinha, Nyanyadzi, 11 July 1997.

^{ix} NAZ, S160/IP1-4, Letter from Alvord to assistant NC Melsetter, 17 September 1934.

^x NAZ, S160/IP104/1/50, Letter from Alvord to CNC, 18 September 1934.

^{xi} Interview with *sabhuku* Robi, Chitinha, Nyanyadzi, 11 July 1997.

^{xii} NAZ, S160/IP1-4, Letter from aNC Melsetter to NC Chipinga, 5 December 1935.

^{xiii} NAZ, S160/IP1-4, Letter from Alvord to acting CNC, 16 December 1935.

^{xiv} NAZ, S160/IP1-4, Letter from Zito Segauke, irrigation supervisor, to Alvord, 19 March 1936.

^{xv} Interview with *sabhuku* Robi, Chitinha, Nyanyadzi, 11 July 1997.

^{xvi} Interview with Ephraim Nyanhanda, kraalhead, Chitinha, Nyanyadzi, 28 May 1997.

^{xvii} NAZ, SRG 3, *Annual Report of the Agriculturist for Natives, 1936*.

^{xviii} NAZ, S160/IP104/1/50, *Organisation of community irrigation schemes*, Alvord, undated (1936).

^{xix} NAZ, S160/IP104/1/50, Letter from Alvord to CNC, 7 August 1939.

^{xx} NAZ, S2814/3585, Letter from Mutambara irrigator to NC Melsetter, 5 May 1942.

^{xxi} NAZ, S2814/3586b, Letter from Alvord to CNC, 11 September 1942.

^{xxii} NAZ, S2814/3586b, Letter from Alvord to CNC, 5 December 1940.

^{xxiii} NAZ, S2814/3586b, Letter from the aNC Melsetter to NC Chipinga, 13 January 1941.

^{xxiv} NAZ, S2814/3586b, Letter from Alvord to CNC, 14 February 1942.

^{xxv} NAZ, S1542/W5/2, Letter from Alvord, to CNC, 11 January 1937.

^{xxvi} NAZ, S1542/W5/2, Letter from aNC Melsetter to CNC, listing cables, 25 October 1937.

^{xxvii} NAZ, S1542/W5/2, Letter from Alvord, to CNC, 25 October 1937.

^{xxviii} NAZ, S2814/3586b, Letter from Palmer, assistant Agriculturist for Natives, to CNC, 28 July 1938.

^{xxix} NAZ, S160/IP104/1/50, Letter from Alvord, to CNC, 14 September 1938.

^{xxx} NAZ, S160/IP3, Letter from Alvord, to CNC, 10 October 1938.

^{xxxi} NAZ, S160/IP1-4, Letter from Palmer, to Alvord, 25 July 1939. To stress the jungle like conditions in Nyanyadzi at that time, Palmer recounted in the same letter how a leopard stolen a duiker, he had shot in the morning, from his field kitchen.

^{xxxii} NAZ, S160/IP3, Letter from Alvord, to CNC, 16 October 1939.

^{xxxiii} NAZ, S2814/3585, Letter from Alvord, to CNC, 7 August 1939.

^{xxxiv} NAZ, S2814/3585, Letter from CNC, to Auditor General, 17 August 1939.

^{xxxv} NAZ, S2814/3585, Letter from Alvord, to CNC, 8 August 1939.

^{xxxvi} NAZ, S160/IP104/1/50, Letter from Alvord, to CNC, 24 August 1939.

^{xxxvii} NAZ, S2814/3585, Letter from secretary for Native Affairs, to secretary of the Department of Justice, 29 September 1939.

^{xxxviii} NAZ, S2814/3585, *Instructions on the allocation, occupation and preservation of plots on irrigation projects in Native Reserves*, Alvord, 5 October 1939.

^{xxxix} NAZ, S2814/3586b, Letter from Alvord to CNC, 16 April 1940.

^{xl} NAZ, S160/IP1-4, Letter from Alvord to aNC Melsetter, 5 April 1941.

^{xli} NAZ, S2814/3586b, Letter from aNC Melsetter to NC Chipinga, 26 November 1940.

^{xlii} NAZ, S160/IP3, Letter from Alvord to CNC, 5 December 1940.

^{xliii} NAZ, S2814/3586b, Letter from Director of Irrigation to the Secretary for Native Affairs, 16 December 1940.

- xliv NAZ, S160/IP104, Letter from Alvord to CNC on famine conditions in the Sabi Valley, 2 September 1941.
- xlv *Annual report of the Agriculturist for Natives for the year 1941.*
- xlvi NAZ, S2814/3585, Letter from Alvord to CNC, 4 December 1941.
- xlvii NAZ, SS2814/3585, Letter from aNC Melsetter to CNC, 17 March 1942.
- xlviii NAZ, S2814/3585, Letter from aNC Melsetter to NC Chipinga, 16 April 1942.
- xliv NAZ, S2814/3585, Letter from Alvord to CNC, 17 April 1942.
- i NAZ, S2814/3585, Letter from Alvord to CNC, 20 April 1942.
- li NAZ, S2814/3585, Letter from aNC Melsetter to NC Chipinga, 28 May 1942.
- lii NAZ, S2814/3585, Letter from Alvord to CNC, 28 May 1942.
- liii NAZ, S2814/3585, Letter from aNC Melsetter to PNC Umtali, 8 June 1942.
- liv NAZ, S160/IP1-4, Letter from Alvord to CNC, 31 December 1942.
- lv NAZ, S160/IP1-4, Letter from Secretary to Treasury to CNC, 15 January 1943.
- lvi NAZ, S160/IP/104, Letter from Alvord to Irrigation Supervisor Guest, Nyanyadzi, 6 January 1940.
- lvii NAZ, S160/IP1-4, Letter from Alvord, to Irrigation Supervisor Guest, Nyanyadzi, 3 October 1940.
- lviii NAZ, S160/IP/104, Letter from Secretary to the Farmers' Co-op, Salisbury, to the Director of Native Agriculture, 27 April 1945.
- lix NAZ, S160/IP1-4, Letter from Alvord to LDO Gilmour, Nyanyadzi, 6 March 1947.
- lx Interview with Luc Jambaya, Nyanyadzi, 7 June 1997.
- lxi NAZ, S160/IP/104, Letter from Alvord to CNC, 16 January 1940.
- lxii NAZ, S160/IP3/2/43, Letter from Alvord to CNC, 1 July 1943.
- lxiii NAZ, S160/IP3, Letter from Alvord, to CNC, 24 November 1943.
- lxiv NAZ, S2814/3586b, Letter from Alvord to CNC, 22 August 1945.
- lxv NAZ, S2814/3586b, Letter from Alvord to CNC, 19 September 1945.
- lxvi NAZ, S2814/3586b, Letter from NC Melsetter to PNC Umtali, 24 October 1945.
- lxvii Interviews with Luc Jambaya, at his shop in Nyanyadzi, 7 & 24 June 1997.
- lxviii Interview with Rishon Gwinya, at his home in Nyanyadzi, 24 July 1997.
- lxix NAZ, S160/IP1-4/16/45, 'Report on meetings held: Irrigation projects', from Alvord to NC Melsetter, 21 September 1945.
- lxx NAZ, S2814/3586b, Letter from Alvord to CNC, 7 April 1945.
- lxxi Interview with Ephraim Nyanhanda, Nyanyadzi, 28 May 1997.
- lxxii NAZ, S160/IP1-4, Monthly report of the LDO Nyanyadzi, 5 February 1945.
- lxxiii NAZ, S160/IP1-4, Monthly report of the LDO Nyanyadzi, 9 March 1945.
- lxxiv NAZ, S160/M1, Letter from NC Melsetter to PNC Umtali, 24 August 1945.
- lxxv NAZ, S160/M1, Letter from Alvord to CNC, 30 October 1945.
- lxxvi NAZ, S160/IP/104, Letter from LDO Nyanyadzi to Alvord, 14 February 1947.
- lxxvii NAZ, S2814/3586b, Letter from Alvord to CNC, 26 June 1946.
- lxxviii Interviews with *sabhuku* Makotamo, Nyanyadzi, 16 June 1996, and with Pambuka, Nyanyadzi, 9 November 1995.
- lxxix NAZ, S160/IP/104, Letter from NC Melsetter to PNC Umtali, 2 June 1946.
- lxxx NAZ, S160/IP3, Letter from Zito Sigauke to his 'dear cousin' Hliziyo, 24 April 1945. Letter from Hliziyo, senior agricultural instructor, to Alvord, 28 April 1945.
- lxxxi NAZ, S160/IP3, Letter from Alvord to NC Melsetter, 1 May 1945.
- lxxxii NAZ, S160/IP/104, Letter from NC Melsetter to PNC Umtali, 2 June 1947.
- lxxxiii NAZ, S160/IP7/6/47, Letter from Alvord to CNC, 12 August 1947. The new policy was authorised by the CNC in September 1948.
- lxxxiv NAZ, S160/IP1-4, Letter from Secretary for Native Affairs, to Alvord, 25 June 1948.
- lxxxv NAZ, S2814/3586b, Letter from PNC Umtali to CNC, 18 February 1946.
- lxxxvi NAZ, S2814/3586b, Letter from Alvord to CNC, 26 February 1946.
- lxxxvii NAZ, S2814/3586b, Letter from NC Melsetter to PNC, 25 March 1946.
- lxxxviii NAZ, S2814/3586b, Letter from PNC Umtali to CNC, 8 April 1946.
- lxxxix NAZ, S2814/3586b, Monthly report of the LDO Nyanyadzi, 3 August 1946. Remark of the NC Melsetter inscribed on it.
- xc NAZ, S2814/3586b, Letter from assistant CNC, to CNC, PNC Umtali, Alvord, NC Chipinga, and NC Melsetter, 27 May 1946.
- xci NAZ, S2814/3586b, Letter from Alvord to CNC, 26 October 1946.
- xcii NAZ, S2814/3586b, Letter from CNC to PNC Umtali, 7 November 1946.
- xciii NAZ, S2814/3586b, Letter from the CNC to the Minister of Native Affairs, 19 October 1951.
- xciv *Annual report of the Agriculturist for Natives for the year 1941.*

- ^{xcv} *Annual report of the Director of Native Agriculture for the year 1945.*
- ^{x cvi} NAZ, S160/IP3, Letter from Inspector, Native Development Department, Umtali circuit, to Alvord, 23 April 1941.
- ^{x cvii} Interview with Mathias Sigauke, son of Zito, at his home in Tonhorai, 5-6 March 1998.
- ^{x cviii} NAZ, S160/IP104, Letter from aNC Melsetter to PNC Umtali, 24 October 1950.
- ^{x cix} *Annual report of the Agriculturist for Natives, for the year 1942.*
- ^c Interview with Luc Jambaya, Nyanyadzi, 24 June 1997.
- ^{ci} NAZ, S160/MS2, Letter from Alvord to the secretary for Native Affairs, Salisbury, 31 March 1944.
- ^{cii} NAZ, S160/MS2, Letter from Alvord to the secretary, Industrial Development Committee, Salisbury, 2 January 1946.
- ^{ciii} NAZ, S160/MS2, Letter from South African Canvas Company Ltd to assistant CNC, Salisbury, 3 June 1947.
- ^{civ} NAZ, S160/IP/104, Letter from LDO Gilmour, Nyanyadzi, to Alvord, January 1948.
- ^{cv} *Annual report of the Director for Native Agriculture, for the year 1948.*
- ^{cvi} NAZ, S160/MS2, Letter from Alvord to the CNC, 9 December 1948.
- ^{c vii} *Annual report of the Director for Native Agriculture for the year 1945.*
- ^{c viii} NAZ, S160/MS2, Letter from Alvord to Provincial Agriculturist, Umtali, 10 December 1948.
- ^{c ix} NAZ, S160/MS2, Letter from the assistant secretary, Native Economic Development, to the secretary for Native Affairs, 15 March 1949.
- ^{cx} NAZ, S160/IP/104, Letter from acting Director Native Agriculture, to Chief Engineer, Native Engineering department, 26 June 1950, see also NAZ, S160/MS2, *Farm carts as at 30th June 1949.*
- ^{cx i} *Annual report of the Director for Native Agriculture, for the year 1948.*
- ^{cx ii} NAZ, S160/IP/104, Letter from Alvord to the assistant secretary, Native Economic Development, 16 August 1949.
- ^{cx iii} NAZ, S160/IP/104, Letter from the assistant irrigation engineer, to circle engineer Salisbury, 13 October 1949.
- ^{cx iv} NAZ, S2400/3779, Letter from CNC to PNC Umtali, 11 September 1947.
- ^{cx v} NAZ, S2400/3779, Letter from NC Melsetter to PNC Umtali, December 1947.
- ^{cx vi} NAZ, S1057/1, Letter from NC Melsetter to NC Chipinga, 9 March 1951.
- ^{cx vii} NAZ, S1057/1, Letter from NC Chipinga to PNC Umtali, 22 March 1951.

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- ⁱ *Annual report of the Director of Native Agriculture for the year 1951.*
- ⁱⁱ NAZ, S160/IP/104, Letter from DNA, to assistant secretary Native Economic Development, 2 January 1951.
- ⁱⁱⁱ *Annual report of the Director of Native Agriculture for the year 1949.*
- ^{iv} *Annual report of the Director of Native Agriculture for the year 1953.*
- ^v DWD file, PROJ/N2-4, Letter from circle engineer, Umtali, to LDO Nyanyadzi, 13 April 1953.
- ^{vi} NAZ, F429/293/1512, 'Notes on African irrigation schemes', by Turk, irrigation officer, CONEX, Salisbury, 26 November 1960.
- ^{vii} NAZ, F429/293/1512, Letter from the irrigation planning officer Manicaland, to prof Phillips, Department of Economics and Marketing, 1 December 1960.
- ^{viii} DWD file, PROJ/N2-4, Letter from assistant irrigation engineer, Umtali circle, to circle engineer, Salisbury, 11 October 1955.
- ^{ix} DWD file, PROJ/N2-4, Letter from circle engineer, Salisbury, to assistant irrigation engineer, Umtali circle, 21 March 1960.
- ^x DWD file, PROJ/N2-4, Letter from circle engineer, Salisbury to assistant circle engineer, Umtali, 27 January 1954.
- ^{xi} DWD file, PROJ/N2-4, Letter from assistant circle engineer, Umtali, to circle engineer, Salisbury, 28 May 1954.
- ^{xii} DWD file, PROJ/N2-4, Letter from PNC Umtali, to assistant irrigation engineer, ID Umtali, 26 May 1954.
- ^{xiii} DWD file, PROJ/N2-4, Letter from actg circle engineer, Salisbury, to assistant circle engineer, Umtali, 1 June 1954.
- ^{xiv} DWD file, PROJ/N2-4, Letter from actg Provincial Agriculturist, Umtali, to PNC, Umtali, 18 August 1954.
- ^{xv} DWD file, PROJ/N2-4, Letter from assistant circle engineer, Umtali, to circle engineer, Salisbury, 7 September 1955.
- ^{xvi} DWD file, PROJ/N2-4, Letter from assistant irrigation engineer, Umtali circle, to circle engineer, Salisbury, 6 June 1956.
- ^{xvii} DWD file, PROJ/N2-4, Letter from Circle Engineer, Umtali, to PNC, Umtali, 17 October 1956.

- xviii DWD file, PROJ/N2-4, Letter from assistant irrigation engineer, Umtali circle, to circle engineer, Salisbury, 2 October 1957.
- xix See DWD file, PROJ/N2-4, Letter from water supplies engineer, Umtali, to deputy provincial secretary engineering, 9 June 1966.
- xx See DWD file, PROJ/N2-4, Phone call by provincial irrigation officer to circle engineer, Umtali, reporting declining discharges from Odzi/Nyanyadzi pumps, 8 December 1961.
- xxi *Report of the secretary for agriculture (Southern Rhodesia), for the year 1962*, Ministry of Agriculture, Southern Rhodesia.
- xxii *Annual report of the Director of Native Agriculture for the year 1949*.
- xxiii *Annual report of the Director of Native Agriculture for the year 1952*.
- xxiv *Annual report of the Director of Native Agriculture for the year 1955*.
- xxv DWD files, PROJ/N2-4, Letter from actg Provincial Agriculturist Manicaland, to PNC, Umtali, 18 August 1954.
- xxvi *Vide Report of the secretary for agriculture (Southern Rhodesia) for the year 1962*, Ministry of Agriculture, Southern Rhodesia.
- xxvii *Department of Conservation and Extension report for the year ended 30th September, 1964*.
- xxviii Interview with D.C.H. Plowes, Mutare, 30 November 1996.
- xxix Interviews with B. Gwitira, Nyanyadzi, 13 February 1995, R. Gwinya, Nyanyadzi, 19 March 1996, and kraalhead Makotamo, Nyanyadzi, 16 June 1996.
- xxx Interview with Mr Nkomo, the first coop chairman, Nyanyadzi, 6 June 1997.
- xxxi *Annual report of the Director of Native Agriculture for the year 1956*.
- xxxii See *annual reports of the Director of Native Agriculture for the years 1952 and 1957*.
- xxxiii *Report of the secretary for agriculture (Southern Rhodesia) for the year 1962*, Ministry of Agriculture, Southern Rhodesia.
- xxxiv Interview with D.C.H. Plowes, Mutare, 30 November 1996.
- xxxv The information presented below is based on interviews held in Nyanyadzi with Amos Rwizi, on 25 July 1997; Barwayi Gwitira, on 13 February 1995; J M Chikotosa, on 7 June 1997; Mai Mukome, on 7 June 1997; Mr and Mrs Nkomo, on 6 June 1997, Rishon Gwinya, on 24 July 1997; and Joseph Mughido, on 13 December 1995. Use was also made of NAZ file S3061, which contains CID information on the Crocodile gang and Oberholzer killing.
- xxxvi PC files, Letter from DC Melsetter to the PC Manicaland, 12 November 1971.
- xxxvii PC files, Letter from DC Melsetter to the PC Manicaland, 12 November 1971.
- xxxviii NAZ, S2641, *Circular no. 178: Irrigation schemes in Tribal Trust Lands and their management*, W.H.H. Nicolle, secretary for Internal Affairs, 31 August 1967.
- xxxix PC files, Letter from Gill, Godlonton and Gerrans, Soilcitors, Salisbury, to PC Manicaland, 11 September 1968.
- xl Interview with Robert Nkomo, Nyanyadzi, 6 June 1997.
- xli PC files, Letter from DC Melsetter to PC Manicaland, 28 October 1968.
- xlii Nyanyadzi scheme was declared irrigable area by the Rhodesia Government Notice No.103 of 1971.
- xliiii *Land Tenure (Suspension of Irrigation) Regulation, 1970*.
- xliv PC files, Letter from PC, Manicaland, to the secretary of Internal Affairs, 14 September 1970.
- lv PC files, Letter from Secretary for Internal Affairs, to PC Manicaland, 26 September 1970.
- lvi PC files, Letter from PC Manicaland, to DC Melsetter, 1 June 1971.
- lvii PC files, Letter from DC Melsetter, to PC Manicaland, 8 June 1971.
- lviii PC files, Letter from senior agricultural officer (irrigation), CONEX, to PC Manicaland, June 1971.
- lix PC files, Anonymous letter from Nyanyadzi plot holders, to the IM Nyanyadzi, 5 January 1972.
- i PC files, Minutes of a special district conference held at Nyanyadzi on 6 March 1968.
- ii PC files, Memo by IM Nyanyadzi, February 1975. The enforcement of the system was confirmed by a former Extension Assistant, Mr Tembani, who operated in Nyanyadzi from 1972-77, Shinja, 10 June 1997.
- iii PC files, Report on trip to Nyanyadzi, 8 May 1975, sent to IM Nyanyadzi by ONKOSA consultancy, Salisbury, 13 June 1975.
- liii Interview with Pambuka, Nyanyadzi, 9 November 1995.
- liv Interview with agricultural extension worker Mutede (operational in Nyanyadzi from 1969-83), Biriwiri, 17 September 1996.
- lv PC files, Letter from DC Melsetter, to PC Manicaland, 17 April 1969.
- lvi PC files, Letter from PWE Manicaland, to PC Manicaland, 30 April 1969.
- lvii CONEX files, *Minutes of special district team conference held at Nyanyadzi on 23rd February 1968*.
- lviii CONEX files, *Nyanyadzi irrigation scheme, project report, March 1969*.
- lix PC files, Letter from the PWE Manicaland to PC Manicaland, 30 April 1969.

- ^{lx} PC files, Letter from Director CONEX, Salisbury, to Provincial CONEX officer, Manicaland, 2 July 1969.
- ^{lxi} PC files, Letter from PWE Manicaland, to PC Manicaland, 22 August 1969.
- ^{lxii} PC files, Letter from the secretary for Internal Affairs, to PC Manicaland, 3 September 1969.
- ^{lxiii} PC files, Letter from Chief Projects Engineer, DWD, to PWE Manicaland, 22 April 1971.
- ^{lxiv} PC files, Letter from Senior Agricultural Officer (irrigation), Manicaland, to PC Manicaland, 19 May 1971.
- ^{lxv} PC files, Letter from the PC Manicaland, to DC Melsetter, 3 September 1971.
- ^{lxvi} PC files, Letter from the water registrar, Water Court of Rhodesia, to the Minister of Water Development, 26 October 1976.
- ^{lxvii} PC files, *Minutes of a meeting held in the office of the Provincial Commissioner Manicaland: on Friday 26th January 1973.*
- ^{lxviii} PC files, *Minutes of a meeting that took place at Nyanyadzi on 25th February 1975.*
- ^{lxix} DWD files, PROJ/N2-3, *Nyanyadzi irrigation scheme project report*, Ministry of Water Development and Ministry of Internal Affairs, Umtali, September 1975.
- ^{lxx} PC files, Letter from DC Melsetter to PC Manicaland, 18 January 1976.
- ^{lxxi} CONEX files, *Monthly report of the IM Nyanyadzi, March 1977.*
- ^{lxxii} PC files, *Minutes of a meeting held at Nyanyadzi irrigation scheme on 10 August 1972.*
- ^{lxxiii} PC files, *Minutes of discussions on Nyanyadzi irrigation scheme for inclusion in the Sabi Regional Development Plan, 8 May 1975.*
- ^{lxxiv} Interview with Tembani, former extension assistant at Nyanyadzi, Shinja, 10 June 1997.
- ^{lxxv} PC files, *Minutes of the second meeting of the Nyanyadzi Inter-Ministerial Development Committee, 28 May 1975.*
- ^{lxxvi} PC files, *Minutes of discussions on Nyanyadzi irrigation scheme for inclusion in the Sabi Regional Development Plan, 8 May 1975.*
- ^{lxxvii} Interview with D.C.H. Plowcs, Mutare, 30 November 1996.
- ^{lxxviii} Interview with Mudyanembwa, Irrigation Supervisor at Deure during the war, Mudanda, 27 October 1997.
- ^{lxxix} Interview with Mutede, former extension assistant at Nyanyadzi, Biriwiri, 17 September 1996.
- ^{lxxx} Interview with M. Pambuka, former chairman of the Nyanyadzi cooperative, Nyanyadzi, 9 November 1995.
- ^{lxxxi} Mudyanembwa, irrigation supervisor at Devure scheme, reported a similar situation. Interview with Mudyanembwa, Mudanda, 27 October 1997.
- ^{lxxxii} The son of Reni Chikotosa, one of the oldest shopkeepers in Nyanyadzi, was picked up by police in 1979 after a CID operative, posing as bar man, had recovered a letter from the comrades indicating which shop keepers had to contribute certain goodies. Chikotosa admitted they were involved in supplying the 'terrorists' (*gandangas* – persons that kill ruthlessly, as they were known amongst white Rhodesians). Chikotosa was released after claiming that they did so only on the penalty of being killed if they refused to. Luc Jambaya confirmed that the Police knew what was happening, but Police let them off the hook, realising that the Nyanyadzi business community faced certain death in case they would refuse such requests. Interview with J M Chikotosa, Nyanyadzi, 7 June 1997, and Luc Jambaya, Nyanyadzi, 7 June 1997.
- ^{lxxxiii} Interview with Rishon Gwinya, Nyanyadzi, 24 July 1997.
- ^{lxxxiv} Interview with Mutede, former extension assistant at Nyanyadzi, Shinja, 10 June 1997.
- ^{lxxxv} Interviews with M. Sithole, Mutema, 30 March 1996; Tembani, Shinja, 10 June 1997; L. Jambaya, Nyanyadzi, 7 June 1997; and R. Gwinya, Nyanyadzi, 24 July 1997.
- ^{lxxxvi} Interview with M. Sithole, former irrigation supervisor at Nyanyadzi, Mutema, 30 March 1996.

ENDNOTES CHAPTER 6

- ⁱ Agritex Manicaland files, Letter from assistant director Derude to Provincial Agricultural Extension Officer Manicaland, 14 May 1985.
- ⁱⁱ These promises came in the wake of two major droughts (in 1992 and again in 1995).
- ⁱⁱⁱ PC files, Report of meeting at Nyanyadzi irrigation scheme, 8 May 1980.
- ^{iv} Agritex Provincial files, 'Confidential report on illegal cultivators who take water at Shinja', written by Sithole, IM Nyanyadzi, 23 October 1984.
- ^v This section is based on interviews with M. Sithole, irrigation manager Nyanyadzi (1980-1991), at Mutema, 30 March 1996; and with Mudyanembwa, irrigation manager at Deure (1982-87) and Nyanyadzi (1992-96), at Mudanda, 27 October 1997.
- ^{vi} Agritex Provincial files, Hand-written declaration by IM Sithole, 4 June 1987.
- ^{vii} Agritex Provincial files, Report by IM Sithole on farmers committee meeting with all plot holders in Nyanyadzi, 10 June 1987.

- viii Agritex Provincial files, Letter from acting PAEO Chipatiso to the acting Provincial chairman, Comrade Kangai, ZANU (PF), 7 October 1987.
- ix Interview with IM Sithole, Mutema, 30 March 1996.
- x Agritex Chimanimani District files, Report by PAEO Manicaland to the District Agricultural Extension officer for Chimanimani, 19 May 1989.
- xi Interviews with former IMC chairman and Agritex Chimanimani district officers, 1995.
- xii Agritex Provincial files, Report on an irrigation meeting, Mutare, 11 July 1989.
- xiii Agritex Provincial files, Report by IM Sithole to the PAEO Manicaland, 18 October 1989.
- xiv Interviews with Agritex Chimanimani district office staff, 1995.
- xv Interview with the CAEO Manicaland, May 1994.
- xvi Agritex Chimanimani District files, Report of IMC meeting at Nyanyadzi to discuss crisis in the scheme, 27 November 1990; Letter from IMC secretary to DAEO Chimanimani, 29 January 1991, requesting a meeting with the DAEO.
- xvii Agritex Chimanimani District files, Letter by secretary IMC to invite Minister of Agriculture, Provincial Governor, Director Agritex for a meeting on 28 February 1991, 8 February 1991.
- xviii Agritex Chimanimani District files, Letter from Member of Parliament Chimanimani to the Chief Agricultural Extension Officer for Manicaland, 17 December 1991, requesting for update on commissioning of raw water pumps at Nyanyadzi; Letter from MP Chimanimani to CAEO Manicaland, 22 January 1992, demanding information on problems at various Save valley irrigation schemes and progress on Nyanyadzi pumps; Letter from Chimanimani District Party Commissioner, ZANU(PF), to the DAEO Chimanimani, 13 May 1992, requesting withdrawal of maintenance fees on account of drought.
- xix Agritex Provincial files, Letter from the Principal Agricultural Extension Officer (Technical) for Manicaland, to AEO (irrigation) Nyanyadzi, 11 February 1993.
- xx Agritex Chimanimani District files, Report by AEO (irrigation) Nyanyadzi on staff meetings on 17 and 23 June 1993.
- xxi Agritex Chimanimani District files, Letter from AEO (irrigation) for Nyanyadzi, to the DAEO Chimanimani, 23 October 1993.
- xxii PC files, Minutes of a special district conference held at Nyanyadzi, 6 March 1968.
- xxiii Agritex Provincial files, Letter from PWE to CAEO Agritex, 19 October 1987.
- xxiv DWD file, PROJ/N2-3, Letter from PWE Manicaland to the director DWD, 23 March 1994.
- xxv Interview with the Provincial Water Engineer Manicaland, Mutare, 15 August 1995.
- xxvi Interview with former irrigation specialist, Gimani, at Nyanyadzi, 13 October 1995.
- xxvii Interview with PWE Manicaland, Mutare, 15 August 1995.
- xxviii Agritex Chimanimani District files, Letter from the acting PWE Manicaland, to Agritex Manicaland, 1 August 1997.
- xxix Agritex Chimanimani District files, Minutes of Water rent awareness meetings in Nyanyadzi and Nenohwe, 18 August 1997, IM Nyanyadzi.

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- i Interview with Mr Kombo, brother to Amos Kombo, at his Nyanyadzi home, 25 July 1997.
- ii PC files, Letter from DC Melsester, to PC Manicaland, 15 February 1971.
- iii PC files, Letter from PC Manicaland to Messrs Termouth, Lawton and Murnance, Umtali based solicitors, 8 March 1971.
- iv Based on interviews with Luc Jambaya and his wife, at Nyanyadzi, 7 June 1997.
- v Based on an interview with Joseph Chikotosa, son of Reni, Nyanyadzi, 7 June 1997.
- vi Interview with Nelson Rudes, Nyanyadzi, 10 February 1995.
- vii Plot survey block A, June-July 1997, and interview with Tsotsi Gudyanga, Nyanyadzi, 9 May 1997.

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- i Interview with Aron Matyashe, at his homestead in Matyashe, 19 May 1997.
- ii Section based on interview with Robi Bayoyuti, kraalhead Mupingirwa, at her homestead in Chitinha, 11 July 1997.
- iii Interview with Robi Bayoyuti, kraalhead Mupingirwa, at her homestead in Chitinha, 11 July 1997.

- ^{iv} Interviews with headman Aron Matyashe, at his Matyashe homestead, 19 May 1997; and with Isaac Aezeki Jena, Tsianwa, 23 July 1997.
- ^v Interview with Ephraim Nyanhanda, Chitinha, 28 May 1997.
- ^{vi} Interview with Aron Matyashe, at his Matyashe homestead, 19 May 1997.
- ^{vii} Interview with Isaac Aezeki Jena, Tsianwa, 23 July 1997.
- ^{viii} In a letter dated 8th April 1992, the Chief acknowledges Matyashe as one of his headmen; In another letter dated 7 September 1994 a former messenger of headman Matyashe confirmed the refusal of Joshua to accept official regalia 'on grounds that to do so was a betrayal of his clan.'; Finally, in a third letter dated 15th November 1994 a former messenger to Chief Muusha's court confirms the status of Matyashe as a headman.
- ^{ix} Interview with Ephraim Nyanhanda, Chitinha, 19 December 1995, and again on 6 June 1997.
- ^x Source: Maintenance records kept by kraalhead and IMC member Ephraim Nyanhanda, 1995-96 season.
- ^{xi} Interview with Agricultural Extension Worker Sithole, Nyanyadzi, 13 April 1997.
- ^{xii} This section is based on an interview with Maanda Nyanhanda, Chitinha, 25 July 1997.
- ^{xiii} Interview with John Gwitira, director Consumer International, at his Harare office, 15 December 1995.
- ^{xiv} Printout of the NACOD constitution, handed to the author by John Gwitira, Harare, 15 December 1995.
- ^{xv} Agritex Manicaland files, Letter from IBDC (NACOD) chairman Hekunguine to Agritex Manicaland, 28 July 1992.
- ^{xvi} Interview with Mr Nzama and Mr Chiridza, Ministry of National Affairs, Chimanimani, 17 November 1996.
- ^{xvii} Interview with Gladman Kundhlande, deputy director SAFIRE, at his home office, Harare, 18 June 1997.
- ^{xviii} Interview with Bill Delehanty, Irish consultant, Nyanyadzi, 9 August 1995.
- ^{xix} Councillor Mughido at a meeting of the Natural Resources Committee, Chimanimani Rural District Council, 7 December 1995.
- ^{xx} Interview with Ron Nyandoro, projects officer, APSO, Harare, 15 December 1995.
- ^{xxi} Letter from Professor Nhachi, NACOD, to Mr Maphosa, regional co-ordinator Zimbabwe/EU Microproject programme, Mutare, 13 January 1997.
- ^{xxii} Group discussion with IMC members Nyanhanda and Jazi, Nyanyadzi, 6 June 1997.
- ^{xxiii} Interview with chief engineer Gatora, Institute of Agricultural Engineering, Hatcliffe, Harare, 18 June 1997.
- ^{xxiv} Interview with Nyanhanda, kraalhead for block C and IMC member, Nyanyadzi, 23 June 1997.
- ^{xxv} Interview with Mr and Mrs Nkomo, Nyanyadzi, 6 June 1997.
- ^{xxvi} Letter from PC, dd 14 September 1970.
- ^{xxvii} Letter from IM Nyanyadzi to DAEO Chimanimani, describing the case, dd 24 January 1997.
- ^{xxviii} Court ruling Headman Gudyanga, 22 September 1996.
- ^{xxix} Group discussion at Agritex Chimanimani office, 4 November 1996.
- ^{xxx} Letter from IM Nyanyadzi to DAEO Chimanimani, 19 May 1997.
- ^{xxxi} Chimanimani Rural District council minutes, resolution C609 of 29 May 1997.
- ^{xxxii} Interview with T Magoba, Nyanyadzi, 12 July 1997.
- ^{xxxiii} Letter from IM Nyanyadzi to Chief Executive Officer, Chimanimani Rural District Council, 1 August 1997.
- ^{xxxiv} Letter from IM Nyanyadzi to AES Marwa, 12 November 1997.
- ^{xxxv} Letter from Chibune & Mahaso, legal practitioners, to Bere Brothers, legal practitioners, 27 November 1997.
- ^{xxxvi} Letter from Bere Brothers, to Chibune & Mahaso, 8 December 1997.
- ^{xxxvii} Letter from Bere Brothers, to Messenger of Court, Chipinge, 13 January 1998.
- ^{xxxviii} Letter from Bere Brothers, to clerk of Court, Magistrate's Court, Mutare, 3 February 1998.
- ^{xxxix} Minutes of IMC meeting, with Agritex staff, Nyanyadzi, 18 February 1998.
- ^{xl} Letter from Bere Brothers, to Zimbabwe Republic Police, Nyanyadzi, 19 February 1998.
- ^{xli} Bill from Messenger of Court, Chipinge, reporting on destruction of beans on plot B19, 14 May 1998.
- ^{xlii} Letter from Kangai, Minister of Lands and Agriculture, to Director Agritex, 22 September 1998.
- ^{xliii} Letter from IM Nyanyadzi to DAEO Chimanimani, 28 October 1998.
- ^{xliv} Letter from the Chief Executive Officer, Chimanimani Rural District Council, to the Provincial Administrator, Mutare, 3 November 1998.
- ^{xlv} Letter from DAEO Chimanimani, to CAEO Manicaland, 30 June 1999.

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- ⁱ NAZ, S160/IP/1-4, Letter from Alvord to CNC, 3 January 1936.
- ⁱⁱ NAZ, S1542/W5/2, Letter from assistant irrigation engineer to Chief Engineer, Irrigation Division, dd 4 January 1937.
- ⁱⁱⁱ NAZ, S1542/W5/2, Reasons for judgement, Water Court Judge, Sgd R McIlwaine, 26 July 1937.

- ^{iv} NAZ, S1729/78/1942, Letter from BSAP Melsetter to assistant NC Melsetter, 20 October 1938.
- ^v NAZ, S1729/78/1942, Letter from assistant NC Melsetter to NC Chipinga, 25 October 1938.
- ^{vi} NAZ, S1729/78/1942, Letter from Alvord to CNC, cc'd to NC Chipinga, 31 October 1938.
- ^{vii} NAZ, S2814/3586b, Letter from acting NC Melsetter to PNC Rusape, 6 November 1947.
- ^{viii} NAZ, S2814/3586b, Letter from senior land inspector to CNC, 19 November 1947.
- ^{ix} NAZ, S160/IP1-4, Letter from Alvord to CNC, 3 January 1948.
- ^x NAZ, S160/IP3, Letter from LDO Gilmour, Nyanyadzi, to NC Melsetter, 5 March 1948.
- ^{xi} NAZ, S160/M1, Letter from the assistant secretary for Native Economic Development, to the Secretary for Native Affairs, 7 January 1950.
- ^{xii} NAZ, S160/M1, Letter from assistant NC Melsetter, to PNC, Umtali, 28 December 1949.
- ^{xiii} NAZ, S2814/3586b, Letter from PNC Umtali to CNC, 7 February 1950.
- ^{xiv} NAZ, S2814/3586b, Letter from PNC Umtali to CNC, 10 November 1950.
- ^{xv} NAZ, S160/IP1-4, Letter from Director DNA, to Assistant Secretary, Native Economic Development, 2 January 1951.
- ^{xvi} DWD files, PROJ/N2/5, Report from the Hydrographic Branch, Irrigation Department, to the Water Court Judge and Assessors, Salisbury, 30 August 1952.
- ^{xvii} PC files, Grant of provisional water right 1170 on the Odzi river, by the registrar of the Water Court, 29 December 1975.
- ^{xviii} Agritex provincial files, Letter from PWE, Mutare, to PAEO, Agritex, 8 March 1982.
- ^{xix} Agritex provincial files, Seasonal report of the irrigation manager Nyanyadzi, summer season 1982/83.
- ^{xx} Agritex provincial files, Monthly report of the irrigation manager Nyanyadzi, February 1983.
- ^{xxi} Agritex Provincial files, Seasonal report of the irrigation Manager Nyanyadzi, summer season 1983/84.
- ^{xxii} Agritex provincial files, Seasonal report of the Irrigation Manager Nyanyadzi, winter season 1984.
- ^{xxiii} Interview with Mahoneke Sithole, former IM Nyanyadzi, at his Mutema home, 30 March 1996.
- ^{xxiv} Interview with E. Marowa, at his farm in Shinja resettlement scheme, 10 September 1994.
- ^{xxv} Interview with furrow irrigator, Shinja, 16 May 1994.
- ^{xxvi} Interview with Mr Tembani, agricultural extension worker, Shinja, 10 June 1997.
- ^{xxvii} Interview with furrow irrigator, Shinja, 16 May 1994.
- ^{xxviii} Interview with Mudyanembwa, irrigation manager at Nyanyadzi in 1994, Mudanda, 27 October 1997.
- ^{xxix} Interview with *Sekuru* Maigiri, at Goeie Hoop farm, 5 January 1996.
- ^{xxx} Interview with Sixpence Matsekete, headman, Ruwedza, 9 December 1995.
- ^{xxxi} Interview with Sixpence Matsekete and his son Atwell, Ruwedza, 21 June 1997.
- ^{xxxii} Interview with irrigator, Chihambiro, 24 July 1996.
- ^{xxxiii} Interview with widow, Chihambiro, 24 July 1996.
- ^{xxxiv} Interview with Piet and Inge de Bruin, Hendriksdal farm, 24 July 1996.
- ^{xxxv} Interview with John Murime, farm labourer, Hendriksdal farm, 9 June 1997.
- ^{xxxvi} Interview with Atwell Matsekete, Ruwedza, 25 May 1997.

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SUMMARY

This study focuses on intervention processes in smallholder agriculture in the Nyanyadzi river catchment, located in Chimanimani district, Manicaland Province, Zimbabwe. In particular it concerns itself with sociotechnical interventions that were implemented by Agritex, the local extension and irrigation service, in the mid-1990s. Despite a flurry of interventions and agrarian policies directed at the intensification of agricultural production and promotion of commercial agriculture in communal and resettlement areas, agricultural production has neither raised sufficiently nor in a sustainable manner.

In this study intervention is taken as a measure to evoke a change in ordering practices of social actors, artefacts and natural elements by pursuing a model of how these three categories of actors might interrelate in a new way. Three models are researched in detail: the model of the smallholder commercial farmer as propagated in the master farmer training programme; the model of intensive smallholder irrigated agriculture in the case of a government managed smallholder irrigation scheme; the model of controlling water flows by means of conservation works and state management at catchment level of the Nyanyadzi river. In all three cases results have been disappointing to date: the master farmer programme has been ineffective in evoking widespread innovations in smallholder agriculture, the performance of the smallholder irrigation scheme has been low at high cost and finally siltation, land degradation and an increasingly fierce struggle over scarce river water have emerged in the catchment.

The history of state interventions in the smallholder sector of Zimbabwe can be characterised by the presence of a strong state and a number of persistent themes and dichotomies, such as the prominence of the Land Question; recurrent swings in emphasis between development and control, modernity and tradition, and voluntary change and force; and a persistent belief in the potential of the mixed farming model to intensify agrarian production in the communal areas. Thus the post-Independence state adopted the very same technocratic policies that limited the possibilities to pursue the peasant option and had elicited widespread support for African nationalism and the ensuing liberation war. This study seeks to understand and explain these continuities in agrarian modernisation policies; qualify the impact of state interventions by paying explicit attention to alternative pathways of agrarian development pursued by smallholder farmers; develop an interdisciplinary understanding of water management and use at three hydraulic levels; and explore the possibilities and room for manoeuvre for reforms that calibrate policy discourse with local practice. It does so by engaging with the relationship between technology and society, informed by the actor-oriented approach, social construction of technology approach, and actor-network theory. The central research question guiding this study is:

'How did state engineered intervention models for agricultural modernisation of smallholder farming emerge, and which continuities and outcomes did these models produce at three hydraulic levels (field, scheme, catchment) in Nyanyadzi river catchment?'

A Native Commissioner, by the name of Keigwin, gave the first push towards the establishment of a government agency concerned with the segregated industrial and agricultural development of the African population in its own area. His plan in 1920 led to a training scheme for African instructors who were to demonstrate improved agricultural practices in the Reserves. With the appointment of E.D. Alvord, an American missionary, in the post of Agriculturist for instruction of natives in 1926, a more encompassing development

scheme was embarked on, relying for its propagation on the concept of 'seeing is believing'. The agricultural improvement package that Alvord developed provided a radical break with existing African agricultural practices, by maximising production per unit of land rather than per unit of labour. Whilst this break was considered necessary to allow the squeeze of the African population into the Reserves, facilitate administrative control and introduce the benefits of modern life to Africans, it may be questioned whether the resultant mixed smallholder farming model suited the social and ecological fabric of the Reserves. The elaboration of Alvord's philosophy of improving the livelihood of Africans led to the appointment of instructors, called demonstrators, in the fields of agriculture, community development, home industries, forestry, irrigation, livestock and conservation. These demonstrators were tasked to develop African households and Reserves along an evolutionary path of modernisation.

The global economic depression and rise of conservationist concerns in the 1930s shifted the emphasis of the demonstrator programme from livelihood improvement to the prevention of destruction of natural resources. Disappointed with the limited spread of his voluntary change programme, Alvord in the 1940s succumbed to conservationist pressures to enforce agricultural modernisation in the Reserves. The expanded agricultural bureaucracy, left after Alvord's retirement in 1950, set out to impose the modernisation package by means of the Native Land Husbandry Act. However, African nationalist protests stopped its implementation in 1961, reverting the initiative over African development to traditionalist Administrators that sought to implement the Rhodesian Front's strict segregationist policies. Thus African modernist aspirations that had been created by Alvord, were squashed by a community development policy that was modelled on a reinvented role for traditional leaders.

In chapter three it is shown how the persistence of the model was achieved by assessing in more detail the methods, ideas and practices that made the master farmer programme the pivotal element of state intervention at field level. Whether the model of modernisation was successful in creating a vibrant, modernist class of African smallholders mimicking their large scale European counterparts is also assessed. The agricultural success and upward mobility of master farmers and early generations of demonstrators suggests Alvord's modernisation strategy paid off initially. However, rather than improving and developing the (communal) area they originated from, Christian master farmers and demonstrators used their agricultural wealth to escape the Reserves, investing in either purchase farms, irrigation or agri-businesses and the education of their children. Thus a modern elite emerged that was actively supported by both the pre- and post-independence state, but was of limited value in terms of the productive or political support rendered. After independence the master farmer programme expanded in scope to facilitate a rapid transfer of technology revolutionise and commercialise the previously neglected smallholder sector. However, the standardised programme capitalised on a farming style that did not fit the ecological and socio-economic fabric of the communal areas and continued to cater for a limited number of wealthy smallholders (6% of the total) that had access to labour, cattle, capital and water.

The second part of this chapter turns to Chimanimani district during the mid-1990s, assessing the meaning and effects of master farmer training, field days and agricultural shows in the different agro-ecological settings of Nyanyadzi river catchment. These three tenets of agricultural extension still formed the lynch pin of Agritex' mission to commercialise smallholder farmers using the image of their large-scale commercial counterparts. Despite their importance as heroes of progress and proof of Agritex' relevance, very little master farmer training was actually done by Chimanimani's extension workers. It is claimed that the

model of the master farmer represents a mode of ordering (both material, social and ritual) that acts as an icon of modernisation. However, the trickle down effect (extension) to the masses of communal area dwellers did not occur. In two subsequent case studies involving master farmers the exclusionary features of the programme are highlighted. The first case study assesses the relationship between field days and master farmers. Master farmers prove to be crucial actors for the reproduction and performance assessment of individual extension agents and their extension practices. Agricultural shows in Chimanimani, both at area and district level, have a highly ritual character where hardly any learning takes place. The second case study demonstrates the active use that master farmers make of their relationship with extension workers as well as their image as good farmers, in order to get access to state mediated resources, like land, water rights, loans and cattle. Aspiring to be a master farmer has less to do with wanting to practise agricultural methods that Agritex propagates, than with a desire to expand one's security and wealth by means of a master farmer badge. The latter serves as a ticket to state resources such as the heifer loan scheme aimed at restocking cattle heds in communal areas.

The second part of the thesis (chapters 4 to 8) assesses the fruits and fallacies of Nyanyadzi irrigation scheme as a model for intensive agricultural modernisation. In the intermezzo a new methodology is presented (technography) for the analysis of the life of an irrigated settlement scheme and the various actors involved in (re)shaping it. It is proposed to treat the social and technical aspects of settlement schemes as different but internally related dimensions of a single object. Furthermore a strict ontological separation of the design of the irrigation scheme from its use is not helpful in analysing its success or failure, since 'closure' hardly occurs, i.e. the exact shape and use that is made of the water-network is subject to change. On the one hand settlement schemes are subject to iterative design processes informed by the disciplinary interests of its navigators (Engineers, Agricolos and Administrators) and shifts in policy discourse or engineering paradigm. On the other hand, attempts to stabilise the scheme as a bounded entity are informed by the technologies of control that are devised by the management to control the behaviour of water and settlers, and counter-discourses and strategies of appropriation on the part of the users.

The technography of Nyanyadzi irrigation scheme is further informed by three paradoxes concerning the role of irrigation in the emergence of sustained opposition against the government. Whilst Nyanyadzi irrigation scheme produced agricultural wealth for its modern users (in contrast to dry land farmers in the Reserves, who could not pursue the 'peasant option'), Nyanyadzi also became the scene of the most violent outbreaks of African opposition during the period of open Nationalism (1957-64). Thirty years later the agricultural success of the scheme had evaporated and the majority of users depended on drought relief hand-outs. Yet, the internally divided Nyanyadzi irrigators persisted in their unified opposition against the government.

Chapter four presents a first go at the base material, Nyanyadzi scheme, as conceived in a dream that Alvord had in 1926. A close look is taken at the construction and emergence of Nyanyadzi irrigation scheme as one of the most successful state engineered models for African modernisation under the vigorous leadership of its patron, Alvord. The technography starts with the rise and demise of the small MuNyanyadzi project that Alvord and his staff initiated in 1934 as a famine protection work and was washed away in a storm flood in 1942. This provided Alvord with a valuable learning experience, which came in handy during the construction and settlement of the big Nyanyadzi project. Nyanyadzi provided Alvord with a key opportunity to realise his vision of agricultural modernisation. Whilst the resulting water-

network succeeded in eradicating famine and increasing agricultural production, the rural industrialisation policy, designed to cater for the unemployed agricultural workers and skilled professionals from an emergent African middle class, floundered. In the conclusion an assessment is given of the model of modernisation that Nyanyadzi scheme provided, strongly reflecting the central tenets of an irrigation factory. It is also shown how Alvord and his growing staff of Agrícolas succeeded in crafting a successful water-network through the (re)alignment of various key elements, i.e. plot holders, crops, water and the market. The resulting water-network transformed the existing *Ndau* society and physical landscape, by transferring wealth from rain-fed cultivators to irrigators, whilst closing off opportunities for wet land cultivation in the Nyanyadzi catchment.

During the next life-phase of the network (1950-67), treated in chapter five, the Agrícolas focused on intensifying and diversifying irrigated production resulting in tangible increases in both the welfare and production attained by the plot holders. Yet, the aspirations of Nyanyadzi's wealthy plot holders went beyond that of the contented agriculturist, resulting in violent opposition during the period of open African nationalist politics (1958-64). Instead of withdrawing, the Smith regime under the *aegis* of its Administrators tightened its hold over the Nyanyadzi water-network and its users, turning the scheme into a highly productive irrigation factory, yet failing to secure a dam to solve the network's persistent water woes. Events during the war of independence ultimately led to closure of the scheme, and sowed the seeds of future splits in the Nyanyadzi community. In the conclusion the life and transformation of Nyanyadzi scheme from a famine protection work to an irrigation factory is reviewed by highlighting three recurrent eddies of thwarted hand-over of the scheme to its users within the general flow of increased state control. A pre-liminary answer to the African nationalist paradox is provided. Both Agrícolas and Administrators blamed the violent outbreaks of resistance on the unemployed and uneducated members of Nyanyadzi community. The latter had been instigated by urban politicians prying on feelings on insecurity that came with the threat of eviction, according to Agrícolas. The Administrators blamed the unrest on a lack of tribal cohesion and discipline. Yet Sithole (1970) and the Nyanyadzi nationalists themselves stress the leading role of Alvord's mission-educated modern men and women, who had acquired new wealth through irrigation and aspired better education, better wages and more business opportunities. African nationalism provided both the voice and means to articulate these desires.

Chapter six assesses the durability and demise of Nyanyadzi scheme as a *state* run venture, by investigating the intricacies of day-to-day management after Independence. The chapter opens with a review of government and donor agency initiated attempts to formulate a new irrigation management policy, stressing the benefits of increased cost recovery through user involvement in their management. The resulting (neo-liberal) policy discourse proved quite at odds with (futile) attempts by government staff on the ground to revive the scheme as a state run irrigation factory. The lack of a clear-cut policy statement on irrigation management allowed local government staff to push for such a revival, whilst head office staff engaged in lucrative donor mediated consultancies that sought to address this lacuna. Attempts to revive the Nyanyadzi factory failed in the face of natural and political opposition. It is argued that policy practice and discourse were enacted in two separate, though unconnected, policy arenas. Whilst massive donor support to and involvement with the smallholder irrigation sector produced an increase in both irrigated commands and managerial capacity on the part of Agritex, it did not contribute to a viable model for handing over the management of these schemes to the users.

The deadlock which emerged between the users and the management, and the complexity of the Nyanyadzi water-network is succinctly demonstrated by assessing attempts of both plot holders and the scheme's management to make the most of the dry winter season in 1995. Whilst a new water rotation schedule provided some reprieve, measures to reduce the crop acreage (one-acre rule) were ineffective, whilst continued break-downs and ultimate closure of the pump station seriously affected yields of the bean crop. Further complications were presented by the ineffectiveness of the irrigation management committee in regulating water distribution and the juggling act of gate keepers (bailiffs) that tried to negotiate their way between the list of official plot holders and *de facto* users of the scheme. The abrupt hand-over of the Nyanyadzi scheme to its politically divided users after 1995 was a direct result of the confluence of three currents, *viz.* the enactment of neo-liberal policies, a cash-strapped government, and the refusal of the plot holders to mobilise the resources required for the scheme's continued operation as an expensive government venture.

Chapter seven focuses on the actual objects of irrigation based modernisation, the users. How did they experience the successive attempts to remould their livelihood? And in what ways did they actively re-shape, re-mould, and re-craft parts of the water-network to suit their own interests? First it is shown that irrigated agriculture in indigenous African schemes in East Africa is only a complementary activity to livestock or rain-fed production, whilst initial investments in the network's construction moderate its operation and maintenance (hydraulic property). The second section re-looks at the emergence of nationalist inspired resistance to the scheme's management in Nyanyadzi, and unravels how different farming strategies produced two types of plot holders that each had their own reasons to support the struggle for independence. By highlighting the effects of inheritance and investment patterns across different generations of Nyanyadzi plot holders, it is shown how political splits in the Nyanyadzi community after independence came to reflect different livelihood orientations and vice versa. An extensive plot survey in blocks A and C of the Nyanyadzi water-network reveals present-day differences in livelihood strategies pursued by plot holders of different religious and political orientation. Two cross-generational accumulation patterns and one recent politically informed accumulation pattern come to light, that produce a different understanding of how plot holders over the years have appropriated the Nyanyadzi water-network. These differences throw a new light on contemporary debates on small holder irrigation and livelihoods, impinging on the relationship between plot sizes and economic viability, the gender effects of irrigated production, the cultural dimension of risk avoidance, and the interplay between the sociotechnical environment of an irrigation scheme and the development of livelihood options by its users.

Chapter eight is devoted to emergent modes of (re-)organisation that various users have developed to respond to and cope with the vagaries imposed by the crumbling official water-network. By means of three case studies it is shown how Nyanyadzi plot holders have re-appropriated and re-aligned some of the constituent elements of the scheme in order to make it work. The modalities of this re-alignment are informed by the two patterns of accumulation described in the previous chapter, and a third strategy that derives its strength from a combination of violence and political patronage (providing a prism to future events in Zimbabwe as a whole, after the start of the land occupations in 1999). The first case study is situated in block C where a traditionalist mode of organisation enables the successful implementation of main canal maintenance and crop marketing activities. The second case study highlights the attempts of modernist plot holders and their urban kin to improve the water supply situation of the scheme as a whole, through the mobilisation of donor funds to line the badly leaking main canal. Finally, a land conflict in block B highlights the failure of

the traditional leadership, Agritex, Rural District Council, and civil court to fend off a family of land claimants, who violently occupied the plot previously held by their evicted father. Ultimately, the heirs of the evictee succeed in chasing the legitimate plot holder off his land through the mobilisation of a politically inspired network of ZANU(PF) politicians.

In the conclusion the three different modes of organisation are compared with emergent forms of organisation in other (irrigated) contexts in Zimbabwe and sub-Saharan Africa. It is shown that original inhabitants generally operate within a traditionalist mode of appropriation perceiving irrigated production as complementary to other livelihood pursuits, whilst the modernist strategy of investing in the education of sons and daughters that in turn re-invest resources through urban networks is quite common in West Africa amongst capitalist commodity producers. Finally some lessons are presented that could inform the modalities of successful irrigation management transfer from government to water users. The Nyanyadzi case study stresses the need for a careful appreciation of locally available modes of organisation that go beyond formal organisational models (i.e. Water User Associations) currently promoted by (inter)national policy makers. Characteristic of such local modes of organisation is their simplicity and fluidity; kin mediated accountability mechanisms that drive the execution of essential tasks (i.e. water distribution, maintenance and marketing); propensity to minimise on energy costs and general avoidance of complex dependency relationships. User ownership of (parts of) the water-network is claimed, not on the basis of an official hand-over, but through the investment of various mixes of social (labour), cultural (chiefly authority), economic (money) and political capital.

The third and final part of the thesis looks at water management at catchment level. The official model regulating water abstraction and use in times of scarcity has been fundamentally changed as a result of the Zimbabwe water reform process (1994-98) that incorporated both local concerns (redress of historically grown inequities) as well as three globally endorsed shifts in water governance. Thus the new Water Act (1998) and institutional constellation are based on river basins, rather than administrative units; decentralised management by (sub) catchment councils that are manned by stakeholder representatives; and the introduction of water pricing as an allocative mechanism. Furthermore an integrated water resource management strategy guides the operational activities of the privatised Zimbabwe Water Authority (ZINWA).

The basic idea for this thesis, the linking and integration of water use and management at three different hydraulic levels, was inspired by an upstream raid organised by the irrigation manager of Nyanyadzi scheme in May 1994. The raid represented an attempt to forcefully bring Nyanyadzi river water to the scheme's intake, leaving a swath of destroyed irrigation furrows in its wake. As shown in chapter nine, the raid and its destructive nature was legitimised in terms of the Water Act of 1927, which provided the officially endorsed mode of ordering water use at a catchment scale. This mode of ordering was initially geared towards capture of the resource water for Rhodesian settler farmers, through the application of the prior appropriation doctrine. This network produced discriminatory features during times of water scarcity and depends for its implementation on a strong monitoring agency that lacked in Nyanyadzi catchment. In contrast, the 'illegal' farmer initiated network of irrigation furrows builds on indigenous water and land use practices that are informed by a wide array of available cultural dispositions, that emphasise the public nature of river water. Whilst actively suppressed during settler rule, the network was quick to re-emerge and establish itself after Independence, presenting a formidable competing force with official water users in the catchment in the 1980s and 1990s. The upstream raids reflected attempts

by the official water-network to get to grips with increasing competition over scarce Nyanyadzi river water. However, the post-independence political dispensation as well as the nature of flowing water worked against the emergence of an effective mechanism to share Nyanyadzi's water amongst its different users. The only tangible effects produced by the raids were the creation of awareness amongst the various water users of their hydraulic interdependency, and the gradual inclusion of furrow irrigators in the official network (through the allocation of more water rights).

By means of a case study on the development and management of a network of irrigation furrows in the remote Ruwedza valley, located in the upper end of Nyanyadzi catchment, the strengths and weaknesses of the indigenous paradigm on catchment water management are highlighted. The paucity of state interventions in Ruwedza have allowed the emergence of water use principles and practices that come close to the professed ideals of integrated land and water management pursued by international policy actors. Various social, material, and agro-ecological characteristics of the furrow network pay tribute to the capricious behaviour of water. The temporary and permeable nature of the used infrastructure helps to distribute water equitably, whilst minimising flood damage. The flexible and distributed spatial set-up of furrow intakes along the river helps to maximise capture of available water, whilst minimising conflicts amongst different furrow irrigators, partially through the practice of staggered planting in the valley in response to altitude related frost risks. During water scarcities the limited supply is distributed equitably through the operation of time-based water rotas that are moderated by the headman, whose furrow is situated at the bottom of the valley. Yet the network is limited in span and subject to collapse during periods of duress, triggered by the extreme water scarcities experienced in 1992 and 1995 and the increased population densities caused by ongoing settlement of new comers. In conclusion, sharp contrasts can be observed between the official network at catchment level that operates on notions of state ownership of water, prior application, and a hard system conception of water use, and the farmer furrow network that is informed by principles of riparian appropriation of a God-given resource, proportional allocation, and network conceptions of flowing water. It is observed that the new Water Act (1998) and institutional constellation that were produced by the Zimbabwe water reforms are ill-equipped to bridge the gap between legality and reality of water use in Nyanyadzi catchment.

In the overall conclusion, first the emergence, continuities and outcomes produced by the three state engineered models for agricultural modernisation of small holder agriculture are presented. It is observed that the emergence of nationalist opposition in Nyanyadzi was not unique but resembles the opposition movements that sprang forth in the Mwea scheme in Kenya and the Office du Niger in Mali. Thus rather than irrigation works feeding the emergence of despotic regimes (Wittfogel 1957), irrigation schemes on the African continent have provided the impetus for the overthrow of despotic regimes. Secondly, some pointers are provided for an alternative way of analysing and crafting water-networks drawing on the strengths of an interdisciplinary focus engrained in technography. It is argued that new approaches should focus on flow rather than control, favour network over hard systems conceptions and draw on existing practices and modalities through a process of *in situ* prototyping and negotiation. Finally the likely impact of the Zimbabwe crisis on smallholder agriculture is provided by presenting the winners and losers of the crisis and assessing the future of agrarian modernisation in Zimbabwe. It is observed that the present crisis spells doom for the state modernisation project and those associated with it, whilst it negatively affects the neo-liberal and democratic foundations of the water reforms. Yet the very ineffectiveness of the new forms of water governance may open alternative avenues for user

based modes of organising the use and distribution of water, as described for the Ruwedza case.

NEDERLANDSE SAMENVATTING

Deze studie bestudeert overheidsinterventies in de kleinschalige landbouw in het stroomgebied van de Nyanyadzi rivier in het oostelijk gelegen Chimanimani district in Zimbabwe. Meer in het bijzonder evalueert deze studie het pakket aan sociaaltechnische maatregelen dat werd geïmplementeerd in the midden van de jaren negentig door Agritex, de lokale landbouw voorlichtings- en irrigatiedienst. Ondanks vele pogingen van overheidswege om de kleinschalige landbouw in communale en hervestiginggebieden te intensiveren en commercialiseren, is de landbouw productie achtergebleven en onvoldoende duurzaam.

In deze studie worden interventies gedefinieerd als maatregelen die een verandering nastreven in de ordening van sociale actoren, artefacten en natuurlijke elementen volgens een (beleids)model dat vastlegt hoe deze drie elementen op een nieuwe wijze samenhang kunnen verkrijgen. Drie interventie modellen worden in detail bestudeerd: het model van de kleinschalige commerciële boer zoals gepropageerd in het 'koploper' trainingsprogramma; het model van intensieve kleinschalige irrigatie middels een door de overheid bestuurd irrigatiestelsel; en het model van het beheersen van waterstroming middels bodembeschermingsmaatregelen en waterwetgeving op stroomgebiedniveau in de Nyanyadzi rivier. Tot dusverre zijn de behaalde resultaten bedroevend: het 'koploper' programma heeft niet geleid tot wijdverbreide innovaties in de kleinschalige landbouw; de landbouwproductie in het irrigatiestelsel is laag tegen een hoge prijs; en het stroomgebied wordt geplaagd door een hoge mate van verzanding en erosie en een intense strijd om het schaarse rivierwater.

De geschiedenis van overheidsbemoeienis met de kleinschalige landbouw in Zimbabwe kan worden gekenmerkt door de aanwezigheid van een sterke staat en een aantal hardnekkige thema's en dualiteiten, zoals de prominente invloed van de Land Kwestie; frequente schommelingen tussen ontwikkeling en bestuur, modernisatie en traditie, vrijwillige verandering en dwang; en een hardnekkig geloof in het vermogen van het gemengde boerenbedrijfmodel om de landbouw in de communale gebieden te intensiveren. En dus werd na de onafhankelijkheid hetzelfde verafschuwde technocratische landbouwbeleid voortgezet dat eerder verantwoordelijk was geweest voor de uitbraak van Afrikaans verzet en de onafhankelijkheidsoorlog. Deze studie hoopt te komen tot een begrip van deze continuïteiten door de invloed van overheidsbeleid te problematiseren en alternatieve modellen van landbouwontwikkeling, ondernomen door kleinschalige boeren zelf, te belichten. Daartoe wordt een interdisciplinair perspectief ontwikkeld op het beheer en gebruik van water op veld-, stelsel- en stroomgebiedniveau. Ook wordt gekeken naar mogelijkheden voor het afstemmen van beleid op bestaande praktijken. De centrale onderzoeksvraag luidt als volgt:

Hoe zijn de beleidsmodellen voor door de overheid geleide modernisatie van de kleinschalige landbouw tot stand gekomen en tot welke continuïteiten en uitkomsten heeft de implementatie van dit beleid geleid op drie hydraulische niveaus (veld, stelsel, stroomgebied) in het stroomgebied van de Nyanyadzi rivier?

De eerste aanzet voor de oprichting van een overheidsinstantie, verantwoordelijk voor de gesegregeerde industriële en agrarische ontwikkeling van de Afrikaanse bevolking in haar eigen gebied, werd gegeven door een koloniaal bestuurder, genaamd Keigwin. Zijn plan uit 1920 voorzag in de opleiding van Afrikaanse instructeurs die verantwoordelijk waren voor het verbeteren van Afrikaanse landbouw praktijken in de Reservaten middels praktische instructie. De aanstelling, in 1926, van E.D. Alvord, een Amerikaans missionaris, voor de post van landbouw instructeur voor Afrikanen, leidde tot de adoptie van een veelomvattend

programma van modernisatie en ontwikkeling. Dit programma vertrouwde voor haar verspreiding op het principe van 'zien is geloven'. Het landbouw verbeteringsprogramma, ontwikkeld door Alvord, brak met bestaande Afrikaanse landbouwpraktijken door haar nadruk op maximalisatie van de productie per hectare in tegenstelling tot de maximalisering van productie per beschikbare arbeidskracht. Hoewel deze breuk noodzakelijk werd geacht om zoveel mogelijk Afrikanen in Reservaten te kunnen proppen, bestuurlijke controle te verwerven en de Afrikaanse bevolking te beschaven, kan men zich afvragen of het kleinschalige gemengde boerenbedrijf dat men voor ogen had wel zo geschikt was, gezien de sociale en ecologische omstandigheden in de Reservaten. Alvord's Christelijke visie op een moderne Afrikaanse agrarische samenleving leidde tot de aanstelling van Afrikaanse instructeurs op het gebied van landbouw, gemeenschapsontwikkeling, huishoudkunde, bosbouw, irrigatie, veeteelt en bodembescherming. Deze instructeurs moesten Afrikaanse huishoudens en Reservaten ontwikkelen volgens een evolutionair pad van modernisering.

De nadruk van het landbouwonwikkelingsprogramma verschoof van welvaartsontwikkeling naar de bescherming van natuurlijke hulpbronnen naar aanleiding van de krach van de wereldeconomie en opkomst van de bodembeschermingsbeweging in de jaren dertig. Teleurgesteld door de geringe effectiviteit van zijn programma voor vrijwillige verandering ging ook Alvord overstag in de jaren veertig. Het model voor landbouwmodernisering werd vervolgens opgelegd aan de Afrikaanse bevolking middels de Native Land Husbandry Act in de jaren vijftig. De implementatie van de wet door een leger van landbouwtechnen werd echter stilgelegd na de uitbraak van massaal verzet geïnspireerd door het Afrikaans nationalisme in 1961. Edoch, het Smith regime dat aan de macht kwam in 1962 herpakte de apartheidspolitiek van weleer onder leiding van bestuurders. Aldus werd de moderniseringsdrang die was gevoed door Alvord de kop ingedrukt en vervangen door een politiek van gemeenschapsontwikkeling onder leiding van Afrikaanse stamleiders.

In hoofdstuk 3 wordt het koploper programma en haar persistentie in detail bestudeerd. Ook wordt gekeken in hoeverre de politiek van Afrikaanse koplopers er in geslaagd is een loyale boeren middenstand te creëren. Het agrarische succes en de welvaart die genoten werd door de eerste generatie van Afrikaanse koplopers en landbouw instructeurs suggereert dat het landbouwmodernisatie model aanvankelijk succesvol was. Edoch in plaats van hun eigen communale gebied te verbeteren en ontwikkelen, gebruikten de koplopers en instructeurs hun nieuw verworven welvaart om de Reservaten te ontvluchten middels de aanschaf van een koop boerderij (purchase farm), irrigatieplot of bedrijfje en investering in de opleiding van hun kinderen. Aldus ontstond een moderne Afrikaanse elite die actief werd ondersteund door zowel de koloniale als de onafhankelijke staat, maar die van kleine betekenis was op politiek en productief vlak. Na de onafhankelijkheid werd het koploper programma uitgebreid om de verwaarloosde kleinschalige agrarische sector te commercialiseren middels de introductie van nieuwe technologieën. Edoch, het gestandaardiseerde pakket aan landbouwverbetering maatregelen was ongeschikt voor de sociaal-economische en ecologische omstandigheden van de communale gebieden. Het was enkel geschikt van nut voor een beperkt aantal welvarende boeren die toegang hadden tot voldoende arbeid, vee, kapitaal en water (zo'n 6% van de gehele boerenstand).

Agritex in Chimanimani poogde mid-1990 de kleinschalige landbouw te moderniseren middels de beproefde methodes van het koploper programma, demonstratiedagen en boeren competities (landbouwtentoonstellingen). Ondanks het feit dat de koplopers op een voetstuk werden verheven als voorbeeld voor de rest en bewijs van de relevantie van Agritex' missie, bleek dat er erg weinig koploper training werd bedreven door de landbouwvoorlichters in

Chimanimani district. Koplopers fungeren dan ook voornamelijk als ideaaltypisch model van landbouwmodernisatie. Ze vormen echter geen effectief middel voor de verspreiding van productieverhogende innovaties onder de gemeenschap van kleinschalige boeren. In twee case studies wordt het exclusieve karakter van het koploper programma belicht. De eerste case toont dat de koplopers de favoriete gastheren zijn van landbouwdemonstraties. Dit ligt aan het feit dat landbouwvoorlichters op hun beurt voor de evaluatie van hun werk afhankelijk zijn van geslaagde demonstraties. De lokale en district competities, waarbij boeren hun producten tentoonstellen voor inspectie, blijken ook voornamelijk gelegenheden waar de overheid haar goede voornemens ten aanzien van landbouw verbetering etaleert. De tentoonstellingen sorteren echter een gering leereffect. De tweede case studie belicht het actieve gebruik dat koplopers maken van hun landbouwvoorlichter en hun status als goede boer om toegang te verkrijgen tot door de overheid beschikbaar gestelde bestaansbronnen, zoals land, waterrechten, leningen en vee. Aspirant koplopers zijn dan ook niet zo zeer geïnteresseerd in de landbouwmethoden die worden gepropageerd door het programma alswel in de toegang die kan worden verkregen tot een betere bestaanszekerheid en welvaart die afhankelijk is van de toekenning van de koploper status. Een goed voorbeeld hiervan vormt de poging van de overheid de communale veestapel op te bouwen middels het beschikbaar stellen van goedkope pinken aan koplopers.

Het tweede deel van het proefschrift (hoofdstuk 4 tot 8) analyseert het wel en wee van het Nyanyadzi irrigatiestelsel als model voor intensieve landbouw modernisatie. Allereerst wordt in het intermezzo een nieuwe methodologie (technografie) gepresenteerd voor de analyse van het leven van een irrigatiestelsel en de verschillende actoren die betrokken zijn in de vormgeving ervan. Daartoe worden de sociale en technische aspecten van het stelsel behandeld als verschillende doch intern gerelateerde dimensies van één enkel object. Aangezien het object geen vaste vorm aanneemt is het niet opportuun een strikt ontologisch onderscheid te maken tussen ontwerp en gebruik bij de analyse van succes of mislukking. Enerzijds zijn stelsels onderhevig aan iteratieve ontwerpprocessen die worden ingegeven door de disciplinaire belangen van ingenieurs, landbouwtechnen en bestuurders alsmede door veranderingen in het beleid en ontwerpparadigma. Anderzijds worden pogingen ondernomen om het stelsel te verankeren waarbij het management nieuwe beheersstrategieën verzint om het gedrag van zowel water als gebruikers te reguleren, terwijl gebruikers middels verschillende strategieën pogen het stelsel toe te eigenen.

De technografie van het Nyanyadzi stelsel werpt een nieuw licht op de rol van irrigatie in de opkomst van lokaal verzet tegen de overheid. Drie paradoxen staan hierbij centraal. Hoewel het stelsel er in slaagde nieuwe welvaart te produceren voor haar moderne gebruikers, in tegenstelling tot de droge landbouw producenten in de Reservaten, vonden de meest gewelddadige uitbraken van Afrikaans verzet tegen de koloniale staat ook plaats in Nyanyadzi (1957-64). Dertig jaar later was de welvaart verdampt en was het merendeel van de gebruikers afhankelijk geworden van overheidssteun gedurende droogtejaren. Toch bleven de intern verdeelde irrigatieboeren in Nyanyadzi verenigd in hun verzet tegen de overheid.

In hoofdstuk 4 wordt de aanleg en opkomst van het irrigatiestelsel in Nyanyadzi nader beschouwd als één van de meest geslaagde voorbeelden van Afrikaanse modernisering door de koloniale staat. In 1934 realiseerde Alvord zijn gedroomde project aan de noordelijke zijde van de rivier op kleine schaal, als het beschermingsmiddel tegen honger. Het MuNyanyadzi project werd echter weggevaagd in 1942 door een stormvloed. Edoch, de lessen die Alvord en zijn getrouwen hadden geleerd op kleine schaal kwamen goed van pas bij de aanleg van het grote, zuidelijk gelegen, Nyanyadzi stelsel. Alvord was een man met een missie.

Nyanyadzi gaf hem de gelegenheid zijn visie op een moderne Afrikaanse samenleving vorm te geven. Het water-netwerk dat hieruit voortvloeide slaagde erin honger uit te bannen en de landbouw productie te intensiveren. Maar het rurale industrialisatie beleid, dat het surplus aan ongeschoolde arbeiders uit de landbouw sector en de hoog opgeleide professionals uit de nieuw verrezen Afrikaanse middenklasse van werk had moeten voorzien, viel in het water. Het modernisatiemodel zoals vormgegeven in Nyanyadzi vertoont sterke gelijkenis met de irrigatiefabrieksstelsels zoals die elders op het continent verrezen. Alvord en zijn groeiende legertje landbouwtechnen slaagden erin een succesvol water-netwerk van de grond te tillen door handig in te spelen op de behoefte aan bestaanszekerheid van Afrikaanse pachters en de nieuw ontstane markten voor maïs en fruitgewassen na de tweede wereldoorlog. De irrigatiestelsels in de Save vallei zijn verantwoordelijk voor een fundamentele verandering van het landschap en de *Ndau* samenleving. Enerzijds vond er een overdracht van welvaart plaats van regenafhankelijke boeren naar irrigatieboeren. Anderzijds werden bestaande wijzen van bescherming tegen honger, zoals jagen en intensieve bebouwing van rivierbedden, onmogelijk gemaakt.

Gedurende de volgende levensfase van het stelsel, behandeld in hoofdstuk 5, concentreerden de landbouwtechnen zich op het intensiveren en variëren van de irrigatieproductie, hetgeen resulteerde in een hoge productie en welvaart voor de pachters. Echter, de ambities van Nyanyadzi's welvarende irrigatieboeren strekte verder dan die van een kleinschalig pachtbedrijf. Dit resulteerde in gewelddadig verzet gedurende de periode van open Afrikaans nationalisme (1958-64). In plaats van zich terug te trekken besloot het Smith regime, middels haar bestuurders, zich intensief met het stelsel en haar gebruikers te bemoeien en haar te transformeren in een hoogproductief fabrieksstelsel, zonder de daarvoor benodigde dam op de Nyanyadzi rivier. Gebeurtenissen tijdens de onafhankelijksoorlog gaven aanleiding tot de tijdelijke sluiting van het stelsel in 1978, en resulteerden in de politieke splitsing van de Nyanyadzi gemeenschap. In de conclusie van hoofdstuk 5 wordt een voorlopig antwoord gegeven op de paradox van welvaart en Afrikaans verzet. Zowel de landbouwtechnen als de bestuurders hielden de werkloze en laag opgeleide leden van de Nyanyadzi gemeenschap verantwoordelijk voor het gewelddadig verzet. De landbouwtechnen vermoedden dat urbane politici gevoelens van bestaansonzekerheid, veroorzaakt door pachtovereenkomsten en de dreiging van uitzetting, opstookten. De bestuurders dachten dat de onrust werd veroorzaakt door een gebrek aan (tribale) gemeenschapszin en discipline. Edoch, Sithole (1970) en de Nyanyadzi nationalisten zelf benadrukken de leidende rol in het verzet van Alvord's door de missie opgeleide moderne mannen en vrouwen. Deze hadden middels irrigatie nieuwe welvaart gegenereerd en ambieerden betere scholen, hogere lonen en meer mogelijkheden voor zakelijke bedrijvigheid. Het Afrikaans nationalisme bood de mogelijkheid deze verlangens kenbaar te maken en actief vorm te geven.

In hoofdstuk 6 staat de duurzaamheid en ondergang van het Nyanyadzi stelsel als een overheidsstelsel centraal. Allereerst wordt een overzicht gegeven van pogingen van de overheid en donor organisaties om een nieuw irrigatie-management beleid te formuleren dat de voordelen van kostendekking en gebruikersbeheer benadrukt. Het resulterende neoliberale beleid was in directe tegenspraak met de, vergeefse, pogingen van lokale managers om het stelsel te doen herleven als fabrieksstelsel. Bij gebrek aan politieke steun voor een dergelijke herijking trok het Agritex management zich in toenemende mate terug in een administratieve werkelijkheid die niet strookte met door donoren gesteunde pogingen de irrigatiestelsels over te dragen aan de gebruikers. De impasse die vervolgens ontstond tussen de gebruikers en het management en de complexiteit van het water-netwerk kwamen pijnlijk aan het licht gedurende het droge winterseizoen van 1995. Terwijl het door het management ingevoerde

waterrotatie schema enige verlichting bracht, waren de maatregelen gericht op reductie van het geïrrigeerde areaal ineffectief en het frequente falen van de pompen fataal voor de oogst van bonen. De irrigatie management commissie bleek machteloos in het effectueren van een eerlijke verdeling van het schaarse water, terwijl de taak van de waterverdelers (bailiffs) werd bemoeilijkt door de discrepantie tussen de officiële lijst van irrigatiepachters en de werkelijke gebruikers van het stelsel. De abrupte overdracht van het stelsel door de overheid aan de politiek verdeelde boeren na 1995 was het directe gevolg van drie samensmeltende stromingen: de adoptie van neoliberaal beleid, een bankroete overheid, en de weigering van de gebruikers om de middelen te mobiliseren die benodigd waren voor de instandhouding van het stelsel als een duur overheidsstelsel.

Hoofdstuk 7 gaat over de gebruikers van het stelsel. Hoe ervaren zij de opeenvolgende pogingen van de staat om hun levens- en productiewijze te veranderen? En op welke wijze poogden ze delen van het water-netwerk te hervormen, bewerken en herschikken naar hun eigen zin? Allereerst wordt getoond dat de geïrrigeerde landbouw in inheemse Afrikaanse irrigatiestelsels enkel dient als complementaire activiteit binnen het bestaande pakket aan veeteelt en regenafhankelijke productie praktijken. De initiële investeringen die gedaan worden tijdens de constructie van het netwerk definiëren de verantwoordelijkheid voor beheer en onderhoud van het netwerk (dmv hydraulische bezitsvorming). De opkomst van nationalistisch verzet in Nyanyadzi wordt in een nieuw licht geplaatst door de identificatie van twee verschillende agrarische productie strategieën die resulteerden in de totstandkoming van twee groepen irrigatiepachters, die ieder hun eigen redenen hadden om de onafhankelijkheidsstrijd te ondersteunen. Door het belichten van de effecten van vererving en investeringspatronen over verschillende generaties van irrigatiepachters in Nyanyadzi, wordt getoond hoe politieke afsplitsingen in de Nyanyadzi gemeenschap een weerslag zijn van verschillende wijzen van het voorzien in levensonderhoud, en vice versa. Middels een uitgebreide inspectie van alle irrigatieveldjes in blok A en C komen huidige verschillen in strategieën van levensonderhoud aan het licht die bedreven worden door pachters van verschillende religieuze en politieke gezindheid. Twee generatieoverstijgende patronen van welvaart accumulatie en één recent politiek georiënteerd accumulatie patroon komen aan het licht. Deze patronen verschaffen inzicht in de wijze waarop de pachters zich het water-netwerk in Nyanyadzi hebben toegeëigend. De verschillen roepen nieuwe vragen op met betrekking tot het huidige debat over kleinschalige irrigatie en bestaanszekerheid. Meer in het bijzonder problematiseert dit hoofdstuk de relatie tussen plotgrootte en economische levensvatbaarheid, de effecten van irrigatie op geslachtsverhoudingen, de culturele dimensie van het minimaliseren van risico's, en de dynamische verhouding tussen de sociaaltechnische omgeving van het stelsel en de vormgeving van productiestrategieën door de gebruikers.

Hoofdstuk 8 gaat over de nieuwe organisatie vormen die verschillende gebruikers hebben ontwikkeld in reactie op de tekortkomingen van het officiële water-netwerk. Middels drie case studies wordt getoond hoe de Nyanyadzi gebruikers zich delen van het stelsel hebben toegeëigend. De wijze van herschikking en toe-eigening is geïnspireerd door de twee patronen van accumulatie die zijn beschreven in het vorige hoofdstuk, alsmede een derde strategie die zijn kracht ontleent aan een combinatie van geweld en politieke patronage (het laatste patroon reflecteert een dominante wijze van toe eigening van land in Zimbabwe na de landbezettingen van 1999). De eerste case studie is gesitueerd in blok C waar een traditionele vorm van organisatie een beperkt aantal clans in staat stelt het hoofdkanaal te onderhouden en tomaten aan de markt te brengen. De tweede case studie laat zien hoe moderne pachters en hun familieleden in de stad pogen de watervoorziening voor het stelsel te verbeteren middels de mobilisatie van donorgelden voor het bekleden van het lekke hoofdkanaal. Een derde case

studie belicht de lotgevallen van een pachter die van zijn land wordt gejaagd door de erven van een uitgezette pachter. Het landconflict laat zien dat noch het traditionele leiderschap, noch Agritex, noch het lokale overheidsbestuur, noch het gerechtshof in staat zijn op te boksen tegen het geweld en het politieke netwerk dat wordt gemobiliseerd door de illegale land eisers. In de conclusie worden de drie vormen van toe-eigening en organisatie vergeleken met die in andere irrigatiestelsels in Zimbabwe en Afrika ten zuiden van de Sahara. Aldus wordt beargumenteerd dat oorspronkelijke bewoners er vaak een traditioneel patroon van toe-eigening op na houden, waarbij geïrrigeerde productie als complementair wordt beschouwd op andere vormen van nering. De moderne strategie van investeren in de opleiding van kinderen die op hun beurt inkomsten herinvesteren in de landbouw middels urbane netwerken komt algemeen voor in West Afrika onder kapitalistische boeren die produceren voor de markt.

Tot slot worden enige lessen getrokken voor toekomstige pogingen irrigatiestelsels over te dragen aan hun gebruikers. De Nyanyadzi case studie wijst op het belang van een zorgvuldige beoordeling van lokaal beschikbare vormen van organisatie die verder strekken dan de gangbare organisatievormen, zoals de watergebruikers organisatie die heden ten dage wordt gepromoot door internationale beleidsmakers. Karakteristiek voor zulke lokale organisatievormen is hun eenvoud en plooibaarheid; verwantschap gerelateerde vormen van verantwoording in de uitvoering van essentiële taken zoals water verdeling, onderhoud en marketing; neiging tot minimaliseren van energiekosten en het vermijden van complexe afhankelijkheids relaties. Delen van het water-netwerk worden toegeëigend door gebruikers, niet op basis van een officiële overdracht, maar door het investeren van verschillende vormen van sociaal (arbeid), cultureel (traditioneel erfgoed), economisch (geld) en politiek kapitaal.

Het derde en laatste deel van deze studie gaat over waterbeheer op stroomgebied niveau. Het officiële model voor de regulering en het gebruik van rivierwater in tijden van schaarste is fundamenteel veranderd door het water hervormingsproces dat plaatsvond in Zimbabwe van 1993 tot 1998. De hervormingen behelzen zowel lokaal geïnspireerde veranderingen (het verhelpen van de historisch gegroeide ongelijkheid in toegang tot water) als drie mondiaal geagendeerde veranderingen in waterbeheer. De nieuwe water wet (1998) en institutionele constellatie zijn geijkt op stroomgebieden in plaats van politiek-administratieve eenheden; behelzen een vorm van gedecentraliseerd waterbeheer door gebruikersraden; en introduceren markt principes in de allocatie van water. De operationele activiteiten van de geprivatiseerde Zimbabweanse Water Autoriteit (ZINWA) worden aangestuurd door een strategie voor integraal waterbeheer.

Het grondidee van deze studie, namelijk het met elkaar verbinden en integreren van water gebruik en beheer op drie verschillende hydraulische niveaus, werd ingegeven door de bovenstroomse activiteiten van de irrigatiemanager van het Nyanyadzi stelsel in Mei 1994. Middels het vernielen van bovenstroomse irrigatie kanaaltjes werd gepoogd meer water te bezorgen bij de inlaat van het Nyanyadzi stelsel. Zoals beargumenteerd in hoofdstuk 9, werd de bovenstroomse excursie en haar destructieve karakter gelegitimeerd door te verwijzen naar de water wet uit 1927. De wet belichaamde het officiële model voor waterbeheer op stroomgebied niveau. Het beheer was er in eerste instantie op gericht om het beschikbare water te concentreren in de handen van Rhodesische blanke boeren middels de toepassing van een doctrine die voorrang verleent aan de eerste gebruiker ('prior appropriation'). In geval van water schaarste leidt dit model tot een asymmetrische verdeling van het beschikbare water. Bovendien vereist het water allocatie systeem een sterke organisatie die het feitelijke watergebruik controleert. Deze organisatie was echter afwezig in het Nyanyadzi

stroomgebied. Het illegale, door boeren geïnitieerde, netwerk van irrigatiekanaaltjes bouwt voort op inheemse praktijken van land and water gebruik en is gebaseerd op een grote verscheidenheid aan beschikbare culturele disposities, waarbij water wordt beschouwd als een algemeen goed dat kan worden gebruikt door alle landgebruikers die land hebben nabij de rivier (de 'riparian doctrine'). Hoewel actief onderdrukt door het Rhodesische regime breidde het netwerk van door boeren geïnitieerde irrigatiekanalen zich snel uit na de onafhankelijkheid. Gedurende de jaren 80 en 90 bleek dit irrigatie-netwerk een geduchte concurrent voor de officieel erkende watergebruikers in het stroomgebied.

De bovenstroomse excursies representeren pogingen van de officieel erkende watergebruikers om de toegenomen strijd om schaars rivierwater in hun voordeel te beslechten. Edoch zowel de nieuwe politieke situatie ('gratis water voor iedereen') als de aard van stromend water stonden de totstandkoming van een effectief water verdelingsmechanisme in de weg. Het enige tastbare effect van de destructieve excursies was dat de verschillende watergebruikers in het stroomgebied zich bewust werden van hun hydraulische afhankelijkheidsrelatie. Middels het toekennen van extra waterrechten werd het waterverbruik van de 'illegale' irrigatiegebruikers geleidelijk gelegaliseerd.

Middels een case studie over het ontstaan en beheer van een netwerk van irrigatiekanaaltjes in de afgelegen Ruwedza vallei, in het bovenstroomse deel van het stroomgebied, wordt de kracht en zwakte van het inheemse paradigma van waterbeheer op stroomgebied niveau belicht. Het gebrek aan overheidsbemoeienis in Ruwedza heeft geleid tot het ontstaan van watergebruik principes en praktijken die het door internationale beleidsmakers zo gewenste ideaal van integraal land en waterbeheer dicht naderen. Verscheidene sociale, materiële en agro-ecologische kenmerken van het netwerk van irrigatiekanaaltjes doen eer aan het ongrijpbare gedrag van stromend water. De tijdelijke en poreuze aard van de gebruikte infrastructuur bevordert de eerlijke verdeling van het water, terwijl het in het geval van een storm de schade beperkt. De flexibele en ruimtelijk verspreide opzet van kanaalinlaten langs de rivier bevordert de maximalisering van de onttrekking van beschikbaar water, terwijl het de kans op conflicten tussen watergebruikers vermindert, gedeeltelijk door de praktijk van het in fasen planten van het geïrrigeerde gewas langs de vallei om vorstrisico's te minimaliseren. Gedurende periodes van waterschaarste wordt het weinige water eerlijk verdeeld middels een door de stamoudste opgelegd schema van water beurten. Het kanaal van de stamoudste is gesitueerd aan het benedenstroomse eind van de vallei. Het inheemse netwerk is echter beperkt van omvang en geneigd ineen te storten gedurende periodes van extreme druk veroorzaakt door droogtes (zoals in 1992 en 1995) en toegenomen bevolkingsdruk. In de conclusie komen scherpe contrasten aan het licht tussen het officiële en inheemse netwerk op stroomgebied niveau. Terwijl het officiële model handelt volgens de principes van overheidsbezit van water, verdeling van water volgens de rangorde van eerder bezit van water, en een benadering voor watergebruik en -verlies die doet alsof we te maken hebben met een gesloten systeem, handelt het inheemse netwerk volgens de principes van algemene toegankelijkheid tot een door God gegeven natuurlijke bestaansbron, proportionele verdeling van het beschikbare water, en benadert stromend water als ware het onderdeel van een netwerk in plaats van een gesloten systeem. De nieuwe waterwet en institutionele constellatie die voortvloeiden uit het hervormingsproces zijn onvoldoende toegerust om het bestaande gat tussen legaliteit en realiteit in waterverbruik in het Nyanyadzi stroomgebied te slechten.

In de algehele conclusie van het proefschrift worden allereerst de totstandkoming, continuïteiten en resultaten van de door de overheid geïmplementeerde modellen voor landbouw modernisatie gepresenteerd. Het blijkt dat de opkomst van nationalistisch verzet in

Nyanyadzi allerm minst uniek was, maar een sterke gelijkenis vertoont met de oppositie die tot uiting kwam in het Mwea stelsel in Kenia en het Office du Niger in Mali. Dus is de vraag gerechtvaardigd of irrigatiestelsels in Afrika niet de aanleiding hebben gegeven tot het omverwerpen van dezelfde tirannieke regimes, waarvan Wittfogel (1957) zei dat ze tot stand kwamen in de Orient middels irrigatiewerken. Geïnspireerd door de interdisciplinaire benadering, die is gevat in technografie, worden enige handvaten aangereikt voor een alternatieve manier van analyseren en construeren van water-netwerken. Ik pleit voor de ontwikkeling van nieuwe benaderingen die de voorkeur geven aan stroming in plaats van aansturing, uitgaan van netwerkconcepties in plaats van systeemanalyses, en hun kracht ontleen aan bestaande praktijken en modaliteiten middels een proces van *in situ* prototype ontwerp en onderhandeling. Tot slot, worden de mogelijke gevolgen van de crisis in Zimbabwe voor de kleinschalige landbouw gepresenteerd middels een voorzichtige prognose van de winnaars en verliezers van de crisis en een evaluatie van de toekomst van het landbouwmodernisatie project in Zimbabwe. De huidige crisis heeft niet veel goeds in petto voor het modernisatieproject, terwijl het de neoliberale en democratische fundering onder de waterhervormingen heeft weggeslagen. Desalniettemin kan de huidige ineffectiviteit van de nieuwe vormen van waterbeheer aanleiding geven voor het betreden van nieuwe wegen in het vormgeven van gebruikersorganisaties rond water verdeling, zoals beschreven voor de Ruwedza vallei.

CURRICULUM VITAE

Alex Bolding was born on 28 May 1968 in Amersfoort, the Netherlands. In 1986 he started his study in Tropical Land and Water use (*Tropische Cultuurtechniek*) at the Wageningen Agricultural University. Subsequently he specialised in irrigation management and reform as well as agricultural extension. He spent his practical period studying farmer managed irrigation schemes in Southern Bhutan (1989-90), after which he undertook MSc thesis research on the possibilities for marginally educated women to participate on the labour market of Veenendaal, the Netherlands. His second MSc thesis research focused on farmer strategies to acquire irrigation water and the development of irrigation technology in a large scale irrigation scheme in Karnataka, India (1992). He graduated with distinction in August 1992. In 1993 he was employed by the Irrigation and Water Engineering Group to co-author a publication on colonial irrigation development in British India. From December 1993 to April 1998 he was employed as associate researcher by DGIS in the NUFFIC funded Zimbabwe programme on women studies, extension, sociology and irrigation (ZIMWESI) that operated in Manicaland Province, Zimbabwe. This job offered him the opportunity to undertake the field work for this study in Nyanyadzi river catchment, Chimanimani District. His active involvement in the Zimbabwe water reform process yielded him a consultancy assignment on the mobilisation of smallholder farmers in sub-catchment councils in Mupfure river basin, Zimbabwe, funded by the Royal Netherlands Embassy (July 1998). After his return to Wageningen he was employed as university lecturer at the Irrigation and Water Engineering group for two years (1999-2001), responsible for co-organising a conference on the Politics of Irrigation Reforms in Hyderabad, India, December 1999. Starting in July 2004, he has been employed as a NWO post-doc researcher at the Irrigation and Water Engineering Group in close association with the ISS in the Hague, IHE in Delft, University of Zimbabwe in Harare and Catholic University of Mozambique in Beira. This 3-year post-doc research investigates cultural divergence in accountability and legitimacy in multi-stakeholder governance in the Pungwe and Save river basins, shared by Mozambique and Zimbabwe.

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